P/N:TCP520VEF0

Service Manual
COLOR Television

CHASSIS : CP-520V

Model : DTX-21G2/21B4/21U7

Caution
: In this Manual, some parts can be changed for improving. their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List)in Service Information Center.

DAEWOO ELECTRONICS

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DOCUMENT HISTORY

VERSION	DATE	COMMENTS
V1.46	07/07/06	Creation of document (Author JS KIM) for project CP520 50Hz TV.

1 MAIN FEATURES

1.1 SPECIFICATIONS

1.1.1 GENERAL

TV standard		PAL - SECAM B/G D/K, PAL I/I, SECAM L/L'
Colour system	Tuner	PAL, SECAM
	AV	PAL, SECAM, PAL 60, NTSC M, NTSC 4.43
Sound system		NICAM B/G, I, D/K, L, FM 2Carrier B/G, D/K
Power consumption		59W
Sound Output Power		4.5W x 2 (at 60% mod, 10% THD)
Speaker		12W 8 ohm x2
Teletext system		10 pages memory FASTEXT (FLOF or TOP)
Aerial input		75 ohm unbalanced
Channel coverage		Off-air channels, S-cable channels and hyperband
Tuning system		frequency synthesiser tuning system
Visual screen size		51cm
Channel indication		On Screen Display
Program Selection		100 programmes
Aux. terminal		EURO-SCART 1 : Audio / Video In and Out, R/G/B In, Slow and Fast switching. EURO-SCART 2 : Audio / Video In and Out, SVHS In. AV3 : Audio-Video Jack on front of cabinet. Headphone jack (3.5 mm) on front of cabinet SVHS3 (option) : Jack on front of cabinet – sound input common with AV3.
Remote Control Unit		R-49C10

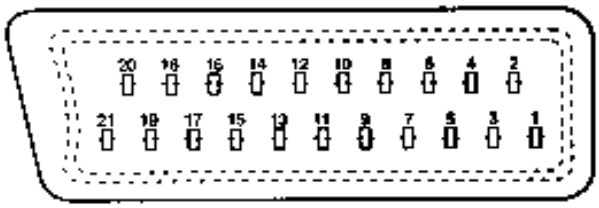
1.1.2 EURO-SCART 1 (21 Pin)

Pin	Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 kΩ
3	Audio Output Left	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
4	Audio Earth	
5	Blue Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 kΩ
7	Blue Input	0.7 Vpp ±0.1V, Impedance 75Ω

8	Slow Switching	TV : 0 to 2V, AV 16/9 : 4.5 to 7V, AV 4/3 : 9.5 to 12V , Impedance > 10 kΩ
9	Green Earth	
10	N.C.	
11	Green Input	0.7 Vpp ± 0.1V, Impedance 75Ω
12	N.C.	
13	Red Earth	
14	Blanking Earth	
15	Red Input	0.7 Vpp ± 0.1V, Impedance 75Ω
16	Fast Switching	0 to 0.4V : Logic " 0" , 1 to 3V : Logic " 1" , Impedance 75Ω
17	Video Out Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75Ω
20	Video Input	1 Vpp ± 3dB, Impedance 75Ω
21	Common Earth	

1.1.3 EURO-SCART 2 (21 Pin)

Pin	Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 kΩ
3	Audio Output Left	0.5 Vrms, Impedance < 1 kΩ, (RF 54% Mod)
4	Audio Earth	
5	Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 kΩ
7	N.C.	
8	N.C.	
9	N.C.	
10	N.C.	
11	N.C.	
12	N.C.	
13	Earth	
14	Earth	
15	Chroma Input	± 3dB for a luminance signal of 1 Vpp
16	N.C.	
17	Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75Ω (Monitor output)
20	Video Input, Y In.	1 Vpp ± 3dB, Impedance 75Ω
21	Common Earth	



1.2 CHANNEL/FREQUENCY TABLE

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
C01	46.25	-	45.75	49.75
C02	48.25	55.75 (L')	53.75	59.25
C03	55.25	60.5 (L')	61.75	77.25
C04	62.25	63.75 (L')	175.25	85.25
C05	175.25	176.00	183.25	93.25
C06	182.25	184.00	191.25	175.25
C07	189.25	192.00	199.25	183.25
C08	196.25	200.00	207.25	191.25
C09	203.25	208.00	215.25	199.25
C10	210.25	216.00	223.25	207.25
C11	217.25	189.25 (LUX)	231.25	215.25
C12	224.25	69.25 (L')	239.25	223.25
C13	53.75	76.25 (L')	247.25	-
C14	-	83.25 (L')	49.75	-
C15	82.25	90.25	57.75	-
C16	-	97.25	65.75	-
C17	183.75	-	77.75	-
C18	192.25	-	85.75	-
C19	201.25	-	-	-
C20	-	-	-	-
C21	471.25	471.25	471.25	471.25
C22	479.25	479.25	479.25	479.25
C23	487.25	487.25	487.25	487.25
C24	495.25	495.25	495.25	495.25
C25	503.25	503.25	503.25	503.25
C26	511.25	511.25	511.25	511.25
C27	519.25	519.25	519.25	519.25
C28	527.25	527.25	527.25	527.25
C29	535.25	535.25	535.25	535.25
C30	543.25	543.25	543.25	543.25
C31	551.25	551.25	551.25	551.25
C32	559.25	559.25	559.25	559.25
C33	567.25	567.25	567.25	567.25
C34	575.25	575.25	575.25	575.25
C35	583.25	583.25	583.25	583.25
C36	591.25	591.25	591.25	591.25
C37	599.25	599.25	599.25	599.25
C38	607.25	607.25	607.25	607.25
C39	615.25	615.25	615.25	615.25
C40	623.25	623.25	623.25	623.25
C41	631.25	631.25	631.25	631.25
C42	639.25	639.25	639.25	639.25
C43	647.25	647.25	647.25	647.25
C44	655.25	655.25	655.25	655.25
C45	663.25	663.25	663.25	663.25

C46	671.25	671.25	671.25	671.25
C47	679.25	679.25	679.25	679.25
C48	687.25	687.25	687.25	687.25
C49	695.25	695.25	695.25	695.25
C50	703.25	703.25	703.25	703.25
C51	711.25	711.25	711.25	711.25
C52	719.25	719.25	719.25	719.25
C53	727.25	727.25	727.25	727.25
C54	735.25	735.25	735.25	735.25
C55	743.25	743.25	743.25	743.25
C56	751.25	751.25	751.25	751.25
C57	759.25	759.25	759.25	759.25
C58	767.25	767.25	767.25	767.25
C59	775.25	775.25	775.25	775.25
C60	783.25	783.25	783.25	783.25
C61	791.25	791.25	791.25	791.25
C62	799.25	799.25	799.25	799.25
C63	807.25	807.25	807.25	807.25
C64	815.25	815.25	815.25	815.25
C65	823.25	823.25	823.25	823.25
C66	831.25	831.25	831.25	831.25
C67	839.25	839.25	839.25	839.25
C68	847.25	847.25	847.25	847.25
C69	855.25	855.25	855.25	855.25
C70	863.25	863.25	863.25	863.25
C71	69.25	-	-	-
C72	76.25	-	-	-
C73	83.25	-	-	-
C74	90.25	-	-	-
C75	97.25	-	-	-
C76	59.25	-	-	-
C77	93.25	-	-	-
S01	105.25	104.75	103.25	105.25
S02	112.25	116.75	111.25	112.25
S03	119.25	128.75	119.25	119.25
S04	126.25	140.75	127.25	126.25
S05	133.25	152.75	135.25	133.25
S06	140.25	164.75	143.25	140.25
S07	147.25	176.75	151.25	147.25
S08	154.25	188.75	159.25	154.25
S09	161.25	200.75	167.25	161.25
S10	168.25	212.75	-	168.25
S11	231.25	224.75	-	231.25
S12	238.25	236.75	-	238.25
S13	245.25	248.75	255.25	245.25
S14	252.25	260.75	263.25	252.25
S15	259.25	272.75	271.25	259.25
S16	266.25	284.75	279.25	266.25
S17	273.25	296.75	287.25	273.25

S18	280.25	136.00	295.25	280.25
S19	287.25	160.00	303.25	287.25
S20	294.25	-	-	294.25
S21	303.25	303.25	-	303.25
S22	311.25	311.25	311.25	311.25
S23	319.25	319.25	319.25	319.25
S24	327.25	327.25	327.25	327.25
S25	335.25	335.25	335.25	335.25
S26	343.25	343.25	343.25	343.25
S27	351.25	351.25	351.25	351.25
S28	359.25	359.25	359.25	359.25
S29	367.25	367.25	367.25	367.25
S30	375.25	375.25	375.25	375.25
S31	383.25	383.25	383.25	383.25
S32	391.25	391.25	391.25	391.25
S33	399.25	399.25	399.25	399.25
S34	407.25	407.25	407.25	407.25
S35	415.25	415.25	415.25	415.25
S36	423.25	423.25	423.25	423.25
S37	431.25	431.25	431.25	431.25
S38	439.25	439.25	439.25	439.25
S39	447.25	447.25	447.25	447.25
S40	455.25	455.25	455.25	455.25
S41	463.25	463.25	463.25	463.25

2 SAFETY INSTRUCTION

WARNING: Only competent service personnel may carry out work involving the testing or repair of this equipment.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high voltage of this receiver is 25KV at max beam current.
The high voltage must not, under any circumstances, exceed 29KV.
Each time a receiver requires servicing, the high voltage should be checked. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY Radiation in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

SAFETY PRECAUTION

Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.
Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.
When replacing a high wattage resistor (metal oxide film resistor) in the circuit board, keep the resistor 10 mm away from circuit board.
Keep wires away from high voltage or high temperature components.
This receiver must operate under AC 230 volts, 50 Hz. NEVER connect to a DC supply or any other voltage or frequency.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this equipment have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by designated symbol on the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitutes replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY Radiation.

3 ALIGNMENT INSTRUCTIONS

3.1 MICROCONTROLLER CONFIGURATION : SERVICE MODE

To switch the TV set into service mode please see instruction below.

1 - Select PR. number 91
2 - Adjust sharpness to minimum and exit all menus.
3 – Within 2 seconds press the key sequence : **RED - GREEN - menu**

The software version is displayed beside the word Service, e.g. “ SERVICE VER 1.46” .

To exit SERVICE menu press **menu** key or **Std By** key.

3.2 SERVICE MODE NAVIGATION

Pr Up/Down remote keys : cycle through the service items available.
Vol -/+ remote keys : Dec./Increment the values within range – Cycle trough option bits.
OK key : Toggle bits in option byte

Order	Item	Default setting
1	HOR CEN	
2	RED GAIN	
3	GRN GAIN	
4	BLUE GAIN	
5	RED BIAS	
6	GRN BIAS	
7	AGC LEVEL	
8	G2 – SCREEN	
9	OPTION1	
10	OPTION2	
11	AVL	
12	PARABOLA	
13	HOR WIDTH	
14	CORNER T	
15	CORNER B	
16	HOR. PARAL	
17	V. LINEAR	
18	V. SLOPE	
19	EW TRAPEZ	
20	S CORRECT	
21	VERT CENT	
22	VERT SIZE	

3.3 MICROCONTROLLER CONFIGURATION : OPTION BITS

There are two option bytes available (16 bits in all). These option bits are available from Service mode. First find the OPTION1 or OPTION2 control, and then use the Volume PLUS/MINUS buttons on the remote control keypad to locate the bits, and OK key to toggle them. The table below shows the two option bytes available;

3.4 OPTION 1

	B7	B6	B5	B4	B3	B2	B1	B0
1	TOP Teletext OFF	FASTEXT (FLOF) OFF	TUBE 4:3	VAI bit set to 1 in SECAM L	Dolby Virtual OFF	SVHS3 disable	**TUNER OPTIONS** 00 = Philips 01 = Not used 10 = Alps, LG 11 = Parstnic, SS	
0	TOP Teletext ON	FASTEXT (FLOF) ON	TUBE 16:9	VAI bit set to 0 in SECAM L	Dolby Virtual ON	SVHS3 enable		

3.5 OPTION 2

	B7	B6	B5	B4	B3	B2	B1	B0
1	Fixed to ‘ 0’	JVC remote control	AVL control OFF	PICTURE TILT ON	5 keys local keyboard	Full ATSS	Double Window Enabled	n.u. Must be set to 1 for future compatibility
0		Daewoo Remote control	AVL control ON	PICTURE TILT OFF	7 keys lacal keyboard	Basic ATSS	Double Window Disabled	

* OPTION

CHASSIS	MODEL	OPTION BIT[b7..b0]			DW[hex]	REMARKS
CP-520V	DTX-21G2/B4/U7	I	0011	1110	3E	OPTION1 “b1,b0” - depends on Tuner
		II	0000	1111	0F	

3.6 NVM default setting

The purpose of this message, when you change a virgin EEPROM, is to allow to modify the NVM DATA to desired values.

1 - Introduction :
The NVM default valus are fixed for the user, but for flexibility in service, these data are stored in NVM and can be changed when the TV set is in a special mode call "NVM EDITOR". This mode can only be access from "FACTORY" mode.

2 - Entering into "FACTORY" mode.
To switch the TV set into FACTORY mode, use the factory remote control, and press on “SVC” key. The factory menu will appear on the screen, showing “FACTORY” , plus other relevant information like software version and date.
WARNING : When in "FACTORY" mode you should not press any key other than the keys described in the procedure below. Unwanted key stroke could misadjust the TV set.

3 - Entering into "NVM EDITOR" mode.
To switch the TV set into NVM EDITOR mode, use the user remote control, and press on “PICTURE/OK” key. The NVM EDITOR window will appear on the screen. This mode allow you to access all data stored in NVM. The current NVM address is given in column "ADDR." in both DECimal and HEXadecimal format. The column DATA gives the value contained at selected address in both DECimal and HEXadecimal format.

4 - Navigation in "NVM EDITOR" mode.
Use Program Up/Dwn keys to select the desired address. Use Volume Up/Dwn keys to change the data at selected address. You must press "PICTURE/OK" key to store value after modification.

The data can be adjusted between 0 and 63.

5 - Exit "NVM EDITOR" mode.
To switch the TV set back into FACTORY mode, use the user remote control, and press on “MENU” key.
The factory menu will appear on the screen, showing “FACTORY”.

6 - Exit "FACTORY" mode.
To exit "FACTORY" mode, use the factory remote control, and press on “SVC” key.
The factory menu will disappear from the screen.

NVM DATA CHANGE LIST			(hex)	CP-520V
No	**Register Name**	**Address**	**Default**	**21G2/B4/U7**
1	OCP_THRESHOLD	0x58F	*0x91*	<-
2	DCXO	0x590	*0x4E*	<-
3	AGC_PHILIPS	0x5C1	*0xAB*	<-
4	AGC_NC	0x5C2	*0xAB*	<-
5	AGC_ALPS, LG	0x5C3	*0xB6*	<-
6	AGC_PARTSNIC	0x5C4	*0xB6*	<-
7	AGC_PHILIPS_START	0x5C5	*0x16*	*O x OF*
8	AGC_NC_START	0x5C6	*0x16*	*O x OF*
9	AGC_ALPS, LG_START	0x5C7	*0x16*	*O x OF*
10	AGC_PARTSNIC_START	0x5C8	*0x16*	*O x OF*
11	AVLLEV	0x621	*0x5*	<-
12	Nor1_Bright	0x64A	*0x23*	<-
13	Nor1_contrast	0x64B	*0x2E*	<-
14	Nor1_Colour	0x64C	*0x1C*	<-
15	Nor1_Sharpness	0x64D	*0x23*	<-
16	Nor1_Tint	0x64E	*0x20*	<-
17	Nor1_JVC_Bri	0x64F	*0x2D*	<-
18	Nor1_JVC_Cont	0x650	*0x2A*	<-
19	Nor1_JVC_Colour	0x651	*0x1B*	<-
20	Nor1_JVC_Sharp	0x652	*0x23*	<-
21	Nor2_Bright	0x653	*0x28*	<-
22	Nor2_Contrast	0x654	*0x13*	<-
23	Nor2_Colour	0x655	*0x19*	<-
24	Nor2_Sharpness	0x656	*0x1B*	<-
25	Nor2_Tint	0x657	*0x20*	<-
26	PresetGainRGB	0x673	*0x2A*	*O x 10*
27	PresetGainRGB	0x674	*0x2A*	*O x 10*
28	PresetGainRGB	0x675	*0x2A*	*O x 10*
29	Cathode_Drive	0x67B	*0x1*	<-
30	Y_delay_PAL_BG	0x686	*0x5*	*O x 02*
31	Y_delay_SECAM_BG	0x687	*0x8*	*O x 0B*
32	Y_delay_PAL_DK	0x688	*0x5*	*O x 0*
33	Y_delay_SCM_DK	0x689	*0x5*	*O x 08*
34	Y_delay_PAL_I	0x68A	*0x7*	*O x 0B*
35	Y_delay_SECAM	0x68B	*0x5*	*O x 07*
36	Y_delay_SECAM-L	0x68C	*0x8*	*O x 07*
37	Y_delay_AV	0x68D	*0xA*	*O x 05*
38	G2_Bright	0x68E	*0x1A*	**0x28**
39	G2_Contrast	0x68F	*0x42*	<-

3.7 TV SET ALIGNMENT

3.7.1 G2 ALIGNMENT

- Tune a colour bar pattern.
- Find the "G2 – SCREEN" item in service mode.
- Adjust screen volume (on FBT) to bring the cursor to central position(Green).

3.7.2 WHITE BALANCE

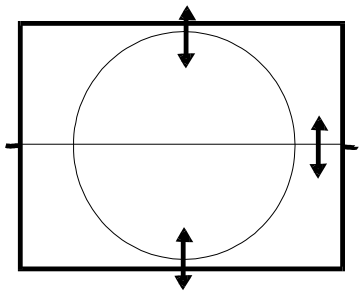
- Select a dark picture and adjust RED BIAS and GRN BIAS to the desired colour temperature.
- Select a bright picture and adjust RED, GRN and BLUE GAIN to the desired colour temperature.

3.7.3 FOCUS

Adjust the Focus volume (on FBT) to have the best resolution on screen.

3.7.4 VERTICAL GEOMETRY

Adjust V. LINEAR (linearity), S CORRECT (S. Correction), VERT SIZE (Vertical amplitude), VERT CENT (vertical centring) to compensate for vertical distortion.



3.7.5 HORIZONTAL PICTURE CENTRING

Adjust HOR CEN (Horizontal centre) to have the picture in the centre of the screen.

3.7.6 AGC

- Make sure option bits are correct for the tuner fitted on the chassis (See above how to change option bits).
- Adjust the antenna signal level at 62 dBμV
- Tune a colour bar pattern.
- Find the "AGC" item in service mode.
- Press the key "OK" on the remote keypad and wait until AGC level stabilise to the optimum value.
- Alternatively, use "Vol Up/Dwn" keys to adjust manually to the desired Tuner Take Over Point (TOP).

4 IC DESCRIPTION

4.1 UOC ^{III} Series

The UOC^{III} series combines the functions of a Video Signal Processor (VSP) together with a FLASH embedded TEXT/Control/Graphics μ-Controller (TCG μ-Controller) and US Closed Caption decoder. In addition the following functions can be added:

- Adaptive digital (4H/2H) PAL/NTSC combfilter
- Teletext decoder with 10 page text memory
- Multi-standard stereo decoder
- BTSC stereo decoder
- Digital sound processing circuit
- Digital video processing circuit

4.1.1 IC MARKING AND VERSION

Chassis	IC marking	OSD languages	ATSS countries	Text
CP-520V		**BULGARIAN, CZECH, GERMAN, DANISH, SPANISH, FRENCH, FINNISH, ENGLISH, GREEK, HUNGARIAN, ITALIAN, NORWEGIAN, DUTCH, POLISH, ROMANIAN, RUSSIAN, SWEDISH, SLOVAKIAN.**	Austria, Belgium, Switzerland, Czech Republic, Germany, Denmark, Spain, France, Finland, GB, Greece, Hungary, Italy, Ireland, Norway, Netherlands, Portugal, Poland, Sweden, Slovak Republic, Others	**PAN-EUROPEAN LATIN, CYRILLIC, GREEK.**

4.1.2. BLOCK DIAGRAM

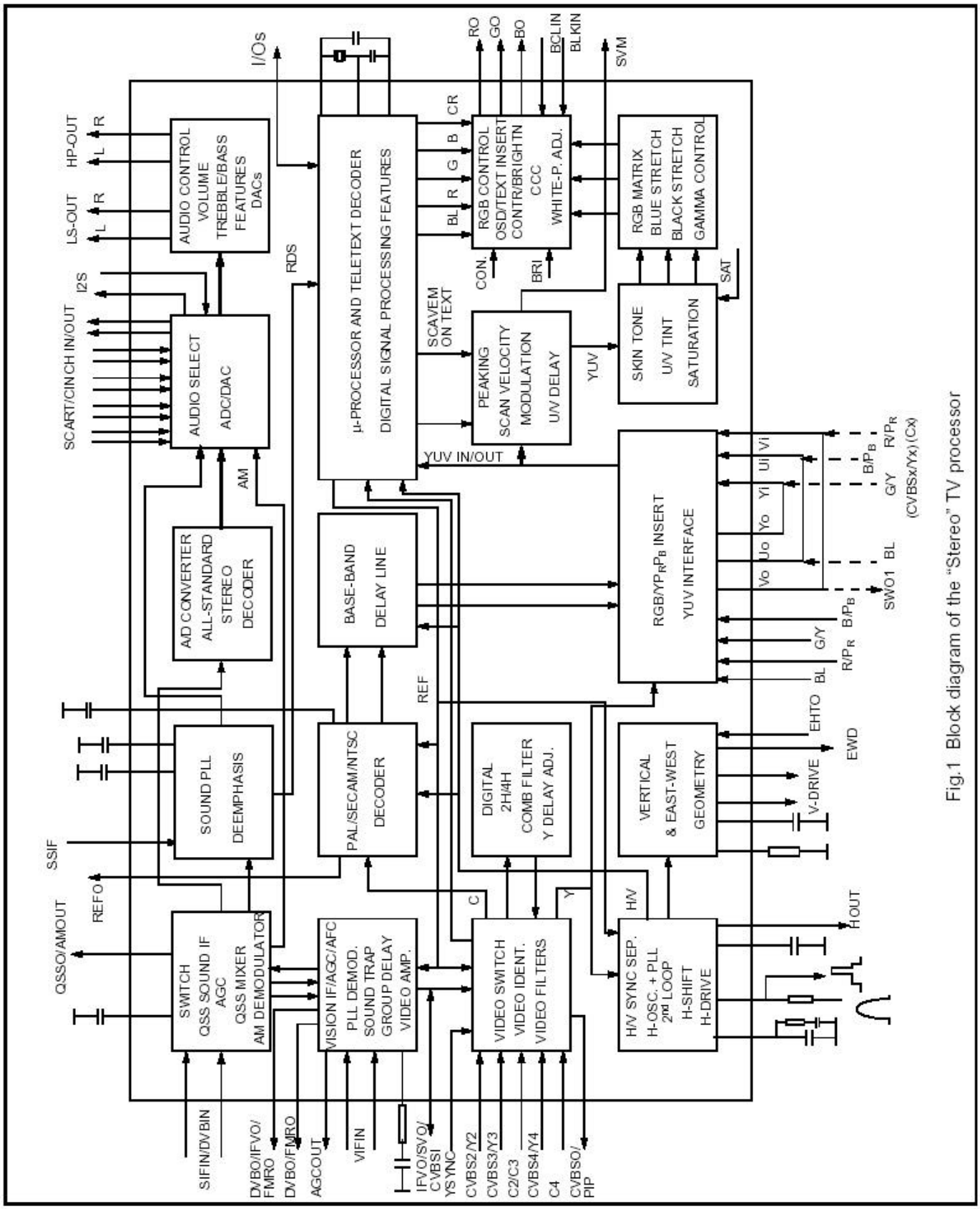


Fig.1 Block diagram of the "Stereo" TV processor

4.1.3. PINNING

QFP 128pin	Symbol	Short Description
1	P1.5/TX	Port 1.5 or UART bus
2	P1.4/RX	port 1.4 or UART bus
3	P1.2/INT2	port 1.2 or external interrupt 2
4	VSSC3	Ground
5	VDDC3	digital supply to core (1.8V)
6	P2.5/PWM4	port 2.5 or PWM4 output
7	P2.4/PWM3	port 2.4 or PWM3 output
8	VSSC/P	digital ground for m-Controller core and periphery
9	P3.3/ADC3	port 3.3 or ADC3 input
10	P3.2/ADC2	port 3.2 or ADC2 input
11	DECV1V8	decoupling 1.8 V supply
12	VDDC1	digital supply to core (+1.8 V)
13	P3.1/ADC1	port 3.1 or ADC1 input
14	P3.0/ADC0	port 3.0 or ADC0 input
15	P2.3/PWM2	port 2.3 or PWM2 output
16	P2.2/PWM1	port 2.2 or PWM1 output
17	P2.1/PWM0	port 2.1 or PWM0 output
18	P2.0/TPWM	port 2.0 or Tuning PWM output
19	VDDP(3.3V)	supply to periphery and on-chip voltage regulator (3.3 V)
20	P1.7/SDA	port 1.7 or I2C-bus data line
21	P1.6/SCL	port 1.6 or I2C-bus clock line
22	P1.3/T1	port 1.3 or Counter/Timer 1 input
23	P0.0/I2SDI1/O	port 0.0 or I2S digital input 1 or I2S digital output
24	P0.1/I2SDO1	port 0.1 or I2S digital output 1
25	P0.2/I2SDO2	port 0.2 or I2S digital output 2
26	P0.3/I2SCLK	port 0.3 or I2S clock
27	P0.4/I2SWS	port 0.4 or I2S word select
28	VSSC2	Ground
29	VDDC2	digital supply to core (1.8 V)
30	P1.1/T0	port 1.1 or Counter/Timer 0 input
31	P1.0/INT1	port 1.0 or external interrupt 1
32	INT0/P0.5	external interrupt 0 or port 0.5 (4 mA current sinking capability for direct drive of LEDs)
33	VDDadc(1.8)	supply voltage video ADC
34	VSSadc	ground for on-chip temperature sensor
35	VDDA2(3.3)	supply voltage SDAC (3.3 V)
36	VDDA(1.8)	analogue supply for audio ADCs (1.8 V)
37	GNDA	Ground
38	VREFAD	reference voltage for audio ADCs (3.3/2 V)
39	VREFAD_POS	positive reference voltage (3.3 V)
40	VREFAD_NEG	negative reference voltage (0 V)
41	VDDA1	analog supply for TCG m-Controller and digital supply for TV-processor (+3.3 V)
42	BO	Blue output

43	GO	Green output
44	RO	Red output
45	BLKIN	black current input
46	BCLIN	beam current limiter input
47	VP3	3rd supply for TV processor
48	GND3	ground 3 for TV-processor
49	B/PBIN3	3rd B input / PB input
50	G/YIN3	3rd G input / Y input
51	R/PRIN3	3rd R input / PR input
52	INSSW3	3rd RGB / YPBPR insertion input
53	VOUT(SWO1)	V-output for YUV interface (general purpose switch output)
54	UOUT(INSSW2)	U-output for YUV interface (2nd RGB / YPBPR insertion input)
55	YOUT	Y-output (for YUV interface)
56	YSYNC	Y-input for sync separator
57	YIN (G/YIN2/CVBS-Yx)	Y-input for YUV interface (2nd G input / Y input or CVBS/YX input))
58	UIN (B/PBIN2)	U-input for YUV interface (2nd B input / PB input)
59	VIN (R/PRIN2/CX)	V-input for YUV interface (2nd R input / PR input or CX input)
60	VDDcomb	supply voltage for comb filter (5 V)
61	VSScomb	ground connection for comb filter
62	HOUT	horizontal output
63	FBISO/CSY	flyback input/sandcastle output or composite H/V timing output
64	SVM	scan velocity modulation output
65	CVBSO/PIP	CVBS / PIP output
66	AUDOUTHPR	audio output for headphone channel (right signal)
67	AUDOUTHPL	audio output for headphone channel (left signal)
68	AUDOUTLSR	audio output for audio power amplifier (right signal)
69	AUDOUTLSL	audio output for audio power amplifier (left signal)
70	C2/C3	chroma-2/3 input
71	CVBS3/Y3	CVBS3/Y3 input
72	AUDIOIN3R	audio 3 input (right signal)
73	AUDIOIN3L	audio 3 input (left signal)
74	CVBS2/Y2	CVBS2/Y2 input
75	AUDIOIN2R	audio 2 input (right signal)
76	AUDIOIN2L	audio 2 input (left signal)
77	C4	chroma-4 input
78	CVBS4/Y4	CVBS4/Y4 input
79	AUDIOIN4R	audio-4 input (right signal)
80	AUDIOIN4L	audio-4 input (left signal)
81	IFVO/SVO/CVBSI (2)	IF video output / selected CVBS output / CVBS input
82	VP2	2nd supply voltage TV processor (+5 V)
83	AGC2SIF	AGC capacitor second sound IF
84	VCC8V	8 Volt supply for audio switches
85	DVBO/FMRO (2)	Digital Video Broadcast output / FM radio output
86	DVBO/IFVO/FMRO (2)	Digital Video Broadcast output / IF video output / FM radio output

87	SIFAGC/DVBAGC (2)	AGC sound IF / internal-external AGC for DVB applications
88	PLLIF	IF-PLL loop filter
89	GND2	ground 2 for TV processor
90	QSSO/AMOUT/AUDEEM (2)	QSS intercarrier output / AM output / deemphasis (front-end audio out)
91	DECSDEM	decoupling sound demodulator
92	AUDOUTSR	audio output for SCART/CINCH (right signal)
93	AUDOUTSL	audio output for SCART/CINCH (left signal)
94	AUDIOIN5R	audio-5 input (right signal)
95	AUDIOIN5L	audio-5 input (left signal)
96	AVL/SWO/SSIF/ REFO/REFIN (2)	Automatic Volume Levelling / switch output / sound IF input / subcarrier reference output / external reference signal input for I signal mixer for DVB operation
97	EHTO	EHT/overvoltage protection input
98	AGCOUT	tuner AGC output
99	SIFIN2/DVBIN2 (2)	SIF input 2 / DVB input 2
100	SIFIN1/DVBIN1 (2)	SIF input 1 / DVB input 1
101	GNDIF	ground connection for IF amplifier
102	IREF	reference current input
103	VSC	vertical sawtooth capacitor
104	VIFIN2	IF input 2
105	VIFIN1	IF input 1
106	VDRA	vertical drive A output
107	VDRB	vertical drive B output
108	EWD/AVL (1)	East-West drive output or AVL capacitor
109	DECBG	bandgap decoupling
110	SECPLL	SECAM PLL decoupling
111	GND1	ground 1 for TV-processor
112	PH1LF	phase-1 filter
113	PH2LF	phase-2 filter
114	VP1	1st supply voltage TV-processor (+5 V)
115	DECDIG	decoupling digital supply
116	VGUARD/SWIO	V-guard input / I/O switch (e.g. 4 mA current sinking capability for direct drive of LEDs)
117	VSSA1	Ground
118	XTALOUT	crystal oscillator output
119	XTALIN	crystal oscillator input
120	VREF_POS_HPR	positive reference voltage SDAC (3.3 V)
121	VREF_NEG_HPL+HPR	negative reference voltage SDAC (0 V)
122	VREF_POS_LSR+HPR	positive reference voltage SDAC (3.3 V)
123	VREF_NEG_LSL+HPL	negative reference voltage SDAC (0 V)
124	VREF_POS_LSL	positive reference voltage SDAC (3.3 V)
125	VDDA3(3.3V)	supply (3.3 V)
126	VDDC4	digital supply to SDACs (1.8V)
127	VSSC4	Ground
128	VSSP2	Ground

4.1.4 **FEATURES**

Analogue Video Processing (all versions)

· Multi-standard vision IF circuit with alignment-free PLL demodulator
· Internal (switchable) time-constant for the IF-AGC circuit
· Switchable group delay correction and sound trap (with switchable centre frequency) for the demodulated CVBS signal
· DVB/VSB IF circuit for preprocessing of digital TV signals.
· Video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed.
· Automatic Y/C signal detector
· Adaptive digital (4H/2H) PAL/NTSC comb filter for optimum separation of the luminance and the chrominance signal.
· Integrated luminance delay line with adjustable delay time
· Picture improvement features with peaking (with switchable centre frequency, depeaking, variable positive/negative peak ratio, variable pre-/overshoot ratio and video dependent coring), dynamic skin tone control, gamma control and blue- and black stretching. All features are available for CVBS, Y/C and RGB/YPBPR signals.
· Switchable DC transfer ratio for the luminance signal
· Only one reference (24.576 MHz) crystal required for the TCG m-Controller, digital sound processor, Teletext and the colour decoder
· Multi-standard colour decoder with automatic search system and various “ forced mode” possibilities
· Internal base-band delay line
· Indication of the Signal-to-Noise ratio of the incoming CVBS signal
· Linear RGB/YPBPR input with fast insertion.
· YUV interface. When this feature is not required some pins can be used as additional RGB/YPBPR input. It is also possible to use these pins for additional CVBS (or Y/C) input (CVBS/YX and CX).
· Tint control for external RGB/YPBPR signals
· Scan Velocity Modulation output. The SVM circuit is active for all the incoming CVBS, Y/C and RGB/YPBPR signals. The SVM function can also be used during the display of teletext pages.
· RGB control circuit with ‘ Continuous Cathode Calibration’ , white point and black level off-set adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
· Contrast reduction possibility during mixed-mode of OSD and Text signals
· Adjustable ‘ wide blanking’ of the RGB outputs
· Horizontal synchronization with two control loops and alignment-free horizontal oscillator
· Vertical count-down circuit
· Vertical driver optimized for DC-coupled vertical output stages
· Horizontal and vertical geometry processing with horizontal parallelogram and bow correction and horizontal and vertical zoom
· Low-power start-up of the horizontal drive circuit

Analogue video processing (stereo versions)

· The low-pass filtered ‘ mixed down’ I signal is available via a single ended or balanced output stage.

Analogue video processing (mono versions)

· The low-pass filtered ‘ mixed down’ I signal is available via a single ended output stage

Digital Video Processing (some versions)

· Double Window mode applications. It is possible to display a video and a text window or 2 text

windows in parallel.
· Linear and non-linear horizontal scaling of the video signal to be displayed.

Sound Demodulation (all versions)

· Separate SIF (Sound IF) input for single reference QSS (Quasi Split Sound) demodulation.
· AM demodulator without extra reference circuit
· The mono intercarrier sound circuit has a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5 MHz). The quality of this system is such that the external band-pass filters can be omitted. In the stereo versions of UOCIII the use of this demodulator is optional for special applications. Normally the FM demodulators of the stereo demodulator/decoder part are used (see below).
· The FM-PLL demodulator can be set to centre frequencies of 4.72/5.74 MHz so that a second sound channel can be demodulated. In such an application it is necessary that an external bandpass filter is inserted.
· The vision IF and mono intercarrier sound circuit can be used for the demodulation of FM radio signals. With an external FM tuner also signals with an IF frequency of 10.7 MHz can be demodulated.
· Switch to select between 2nd SIF from QSS demodulation or external FM (SSIF)

Audio Interfaces and switching (stereo versions with Audio DSP)

· Audio switch circuit with 4 stereo inputs, a stereo output for SCART/CINCH, 1 stereo output for HEADPHONE. The headphone channel has an analogue volume control circuit for the L and R channel. Finally 1 stereo SPEAKER output with digital controls.
· AVL (Automatic Volume Levelling) circuit for the headphone channel.
· Digital input crossbar switch for all digital signal sources and destinations
· Digital output crossbar for exchange of channel processing functionality
· Digital audio input interface (stereo I2S input interface)
· Digital audio output interface (stereo I2S output interface)

Audio interfaces and switching (AV stereo versions without Audio DSP)

· Audio switch circuit with 4 stereo inputs, a stereo output for SCART/CINCH and a stereo SPEAKER output with analogue volume control.
· Analogue mono AVL circuit at left audio channel

Audio interfaces and switching (mono versions)

· Audio switch circuit with 4 external audio (mono) inputs and a volume controlled output
· AVL circuit

Stereo Demodulator and Decoder (full stereo versions)

· Demodulator and Decoder Easy Programming (DDEP)
· Auto standard detection (ASD)
· Static Standard Selection (SSS)
· DQPSK demodulation for different standards, simultaneously with 1-channel FM demodulation
· NICAM decoding (B/G, I, D/K and L standard)
· Two-carrier multistandard FM demodulation (B/G, D/K and M standard)
· Decoding for three analog multi-channel systems (A2, A2+ and A2*) and satellite sound
· Adaptive de-emphasis for satellite FM
· Optional AM demodulation for system L, simultaneously with NICAM
· Identification A2 systems (B/G, D/K and M standard) with different identification time constants
· FM pilot carrier present detector
· Monitor selection for FM/AM DC values and signals, with peak and quasi peak detection option
· BTSC MPX decoder
· SAP decoder
· dbx®noise reduction (4)
· Japan (EIAJ) decoder
· FM radio decoder
· Soft-mute for DEMDEC outputs DEC, MONO and SAP

· FM overmodulation adaptation option to avoid clipping and distortion

Audio Multi Channel Decoder (stereo versions with Audio DSP)

· Dolby®Pro Logic®(DPL) (1)

· Five channel processing for Main Left and Right, Subwoofer, Centre and Surround. To exploit this feature an external DAC is required.

Volume and tone control for loudspeakers (stereo versions with Audio DSP)

· Automatic Volume Level (AVL) control
· Smooth volume control
· Master volume control
· Soft-mute
· Loudness
· Bass, Treble
· Dynamic Bass Boost (DBB) (2)
· Dynamic Virtual Bass (DVB) (3)
· BBE®Sound processing (4)
· Graphic equalizer
· Processed or non processed subwoofer
· Programmable beeper

Reflection and delay for loudspeaker channels (stereo versions with Audio DSP)

· Dolby®Pro Logic®Delay (1)
· Pseudo hall/matrix function

Psycho acoustic spatial algorithms, downmix and split in loudspeaker channels (stereo versions with Audio DSP)

· Extended Pseudo Stereo (EPS) (5)
· Extended Spatial Stereo (ESS) (6)
· Virtual Dolby®Surround (VDS 422,423) (1)
· SRS 3D and SRS TruSurround®(4)

RDS/RBDS

· Demodulation of the European Radio Data system (RDS) or the USA Radio Broadcast Data System (RBDS) signal
· RDS and RBDS block detection
· Error detection and correction
· Fast block synchronisation
· Synchronisation control (flywheel)
· Mode control for RDS/RBDS processing
· Different RDS/RBDS block information output modes

m**-Controller**

· 80C51 m-controller core standard instruction set and timing
· 0.4883 ms machine cycle
· maximum of 256k x 8-bit flash programmable ROM
· maximum of 8k x 8-bit Auxiliary RAM
· 12-level Interrupt controller for individual enable/disable with two level priority
· Two 16-bit Timer/Counter registers
· One 24-bit Timer (16-bit timer with 8-bit Pre-scaler)
· WatchDog timer
· Auxiliary RAM page pointer
· 16-bit Data pointer
· Stand-by, Idle and Power Down modes
· 24 general I/O
· 14 bits PWM for Voltage Synthesis Tuning
· 8-bit A/D converter with 4 multiplexed inputs

· 5 PWM (6-bits) outputs for analogue control functions
· Remote Control Pre-processor (RCP)
· Universal Asynchronous Receiver Transmitter (UART)

Data Capture

· Text memory up to 10 pages
· Inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT)
· Data Capture for US Closed Caption
· Data Capture for 525/625 line WST, VPS (PDC system A) and Wide Screen Signalling (WSS) bit decoding
· Automatic selection between 525 WST/625 WST
· Automatic selection between 625 WST/VPS on line 16 of VBI
· Real-time capture and decoding for WST Teletext in Hardware, to enable optimized m-processor throughput
· Automatic detection of FASTEXT transmission
· Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters
· Signal quality detector for video and WST/VPS data types
· Comprehensive teletext language coverage
· Vertical Blanking Interval (VBI) data capture of WST data

Display

· Teletext and Enhanced OSD modes
· Features of level 1.5 WST and US Close Caption
· 50Hz/60Hz display timing modes
· Two page operation for 16:9 screens
· Serial and Parallel Display Attributes
· Single/Double/Quadruple Width and Height for characters
· Smoothing capability of both Double Size, Double Width & Double Height characters
· Scrolling of display region
· Variable flash rate controlled by software
· Soft colours using CLUT with 4096 colour palette
· Globally selectable scan lines per row (9/10/13/16/) and character matrix [12x9, 12x10, 12x13, 12x16, 16x18, (VxH)]
· Fringing (Shadow) selectable from N-S-E-W direction
· Fringe colour selectable
· Contrast reduction of defined area
· Cursor
· Special Graphics Characters with two planes, allowing four colours per character
· 64 software redefinable On-Screen display characters
· 4 WST Character sets (G0/G2) in single device (e.g. Latin, Cyrillic, Greek, Arabic)
· G1 Mosaic graphics, Limited G3 Line drawing characters
· WST Character sets and Closed Caption Character set in single device
· SVM for Text

4.2 LA42032 STEREO AUDIO AMPLIFIER

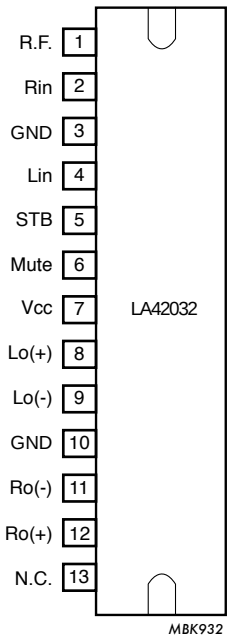
The LA42032 is a dual-channel audio power amplifier with an output power of 2 x 5 W at an 8 Ω load and a 9 V supply.

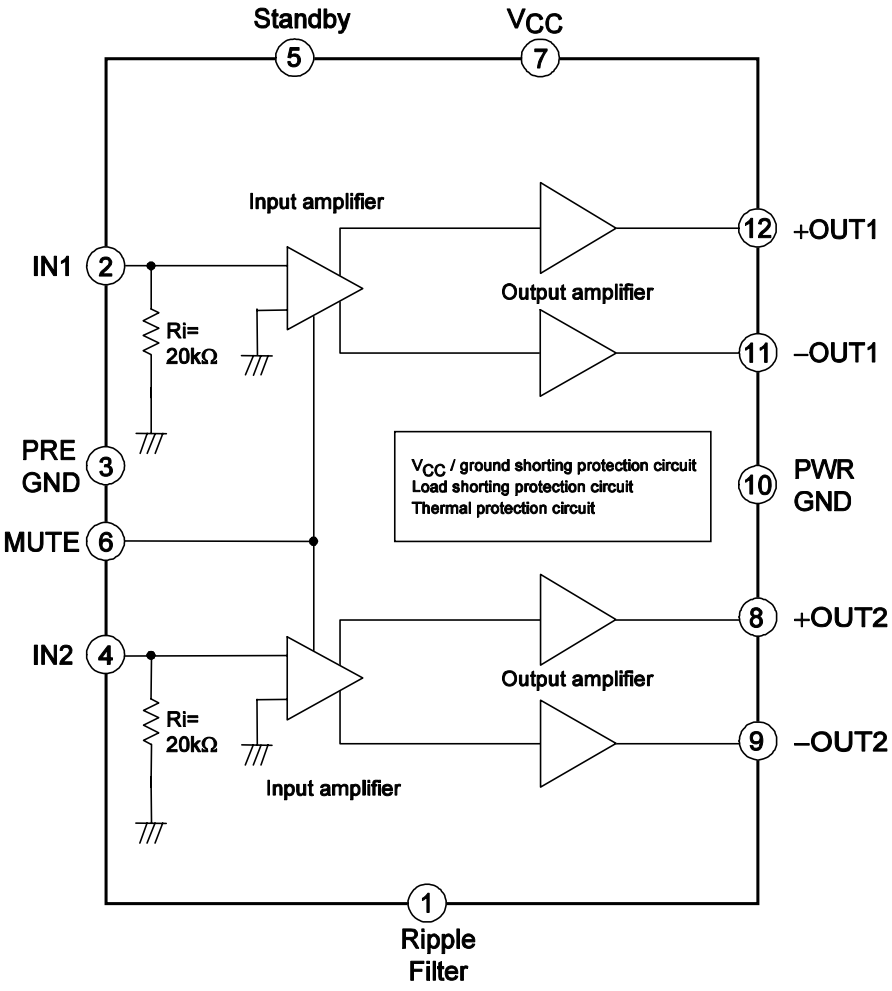
4.2.1 FEATURES

- 5W x 2 Channel(Vcc=9V, R_L=8Ω)
- Standby function
- Mute function
- Thermal protection circuit

Pin description

Pin	Symbol	Description
1	R.F.	Ripple Filter
2	Rin	Right input
3	GND	Ground
4	Lin	Left Input
5	STB	Standby
6	Mute	Mute
7	Vcc	Supply Voltage
8	Lo(+)	Positive Left output
9	Lo(-)	Negative Left Output
10	GND	Ground
11	Ro(-)	Negative Right Output
12	Ro(+)	Positive Right Output
13	N.C.	Not Connected





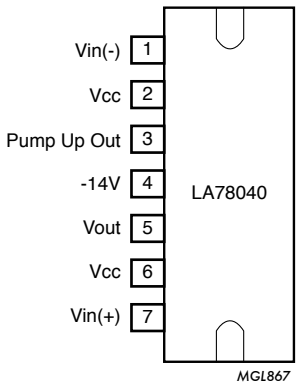
Block diagram LA42032

4.3 LA78040 VERTICAL AMPLIFIER

The LA78040 are power circuit for use in 90° and 110° colour deflection systems for field frequencies of 25 to 200Hz field frequencies, and for 4:3 and 16/9 picture tubes. The IC contains a vertical deflection output circuit, operating as a high efficiency class G system. The full bridge output circuit allows DC coupling of the deflection coil in combination with single positive supply voltages.

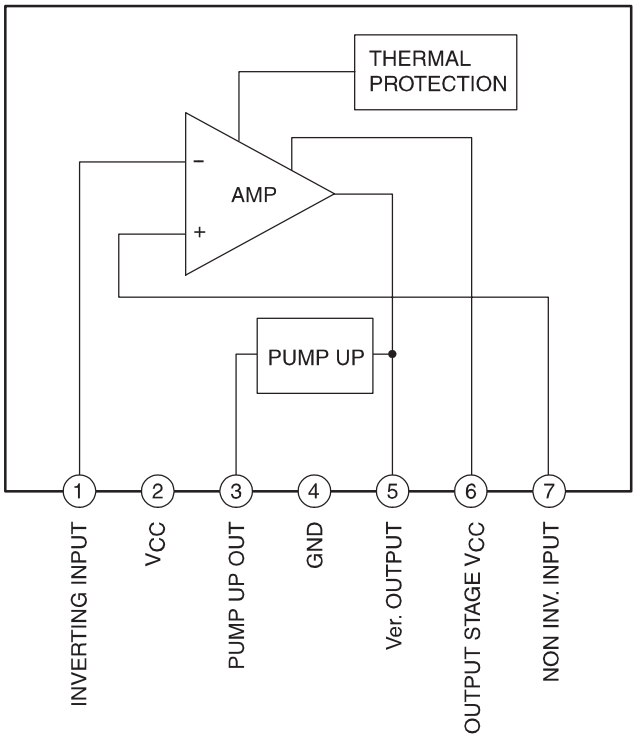
4.3.1 FEATURES

- Built-in pump-up circuti for low power dissipation
- Vertical output circuit
- Thermal protection circuit



Pinning

Pin	Symbol	Description
1	Vin(-)	Inverting Input
2	Vcc	Supply voltage
3	Pump Up Out	Pump Up Out
4	-14V	-14V
5	Vout	Ver. Output
6	Vcc	Output Stage Vcc
7	Vin(+)	Non Inv. Input



Block diagram LA78040

4.4 24WC16 - 16 KB EEPROM

Features :
- 16 Kbit serial I2C bus EEPROM
- 400KHz I2C Bus Compatible
- supply voltage : 1.8 V to 6.0 V
- Low Power CMOS Technology
- 1 Million Erase/Write cycles (minimum)
- 100 year data retention (minimum)

Pin description

Pin No.	Name	Description
1, 2, 3	A0, A1, A2	Device address – not used
5	SDA	Serial Data/Address Input/Output
6	SCL	Serial clock
7	WP	Write control
8	Vcc	Supply voltage
4	Vss	Ground

The memory device is compatible with the I2C memory standard. This is a two wire serial interface that uses a bi-directional data bus and serial clock. The memory carries a built-in 4-bit unique device type identifier code (1010) in accordance with the I2C bus definition.

Serial Clock (SCL)
The SCL input is used to strobe all data in and out of the memory.
Serial Data (SDA)
The SDA pin is bi-directional, and is used to transfer data in or out of the memory.

4.5 STR - W6754

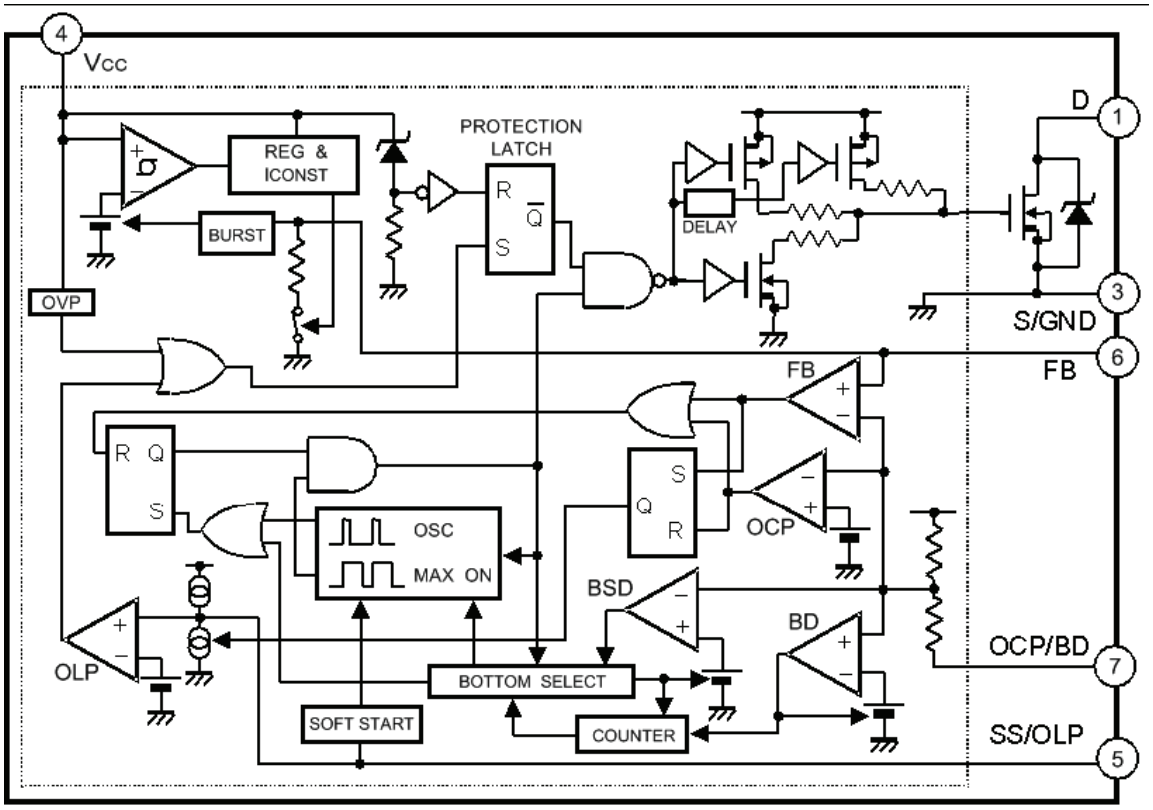
4.5.1 GENERAL DESCRIPTION

The STR-W6754 is a quasi-resonant regulator specifically designed to satisfy the requirements for increased integration and reliability in switch-mode power supplies. It incorporates a primary control and drive circuit with an avalanche-rated power MOSFET.

4.5.2 FEATURES

- Auto-Bias Function Stable Burst Operation Without Generating Interference
- Internal Off-Timer Circuit
- Built-In Constant-Voltage Drive
- Multiple Protections: Pulse-by-Pulse Overcurrent Protection
  Overload Protection with Auto Recovery
  Latching Overvoltage Protection
  Undervoltage Lockout with Hysteresis
- RoHS Compliant

4.5.3 BLOCK DIAGRAM



4.5.4 PIN DESCRIPTION

PIN	NAME	SYMBOL	DESCRIPTION
1	Drain	D	MOSFET drain
3	Source/Ground	S/GND	Ground
4	Supply	Vcc	Power Supply
5	Overload Protection	SS/OLP	Overload Protection and Soft Start Operation Time set up
6	Feedback	FB	Constant Voltage Control Signal Input, Burst mode Oscillation Control
7	Overcurrent Protection	OCP/BD	Overcurrent Protection Signal Input/ Bottom Detection Signal Input

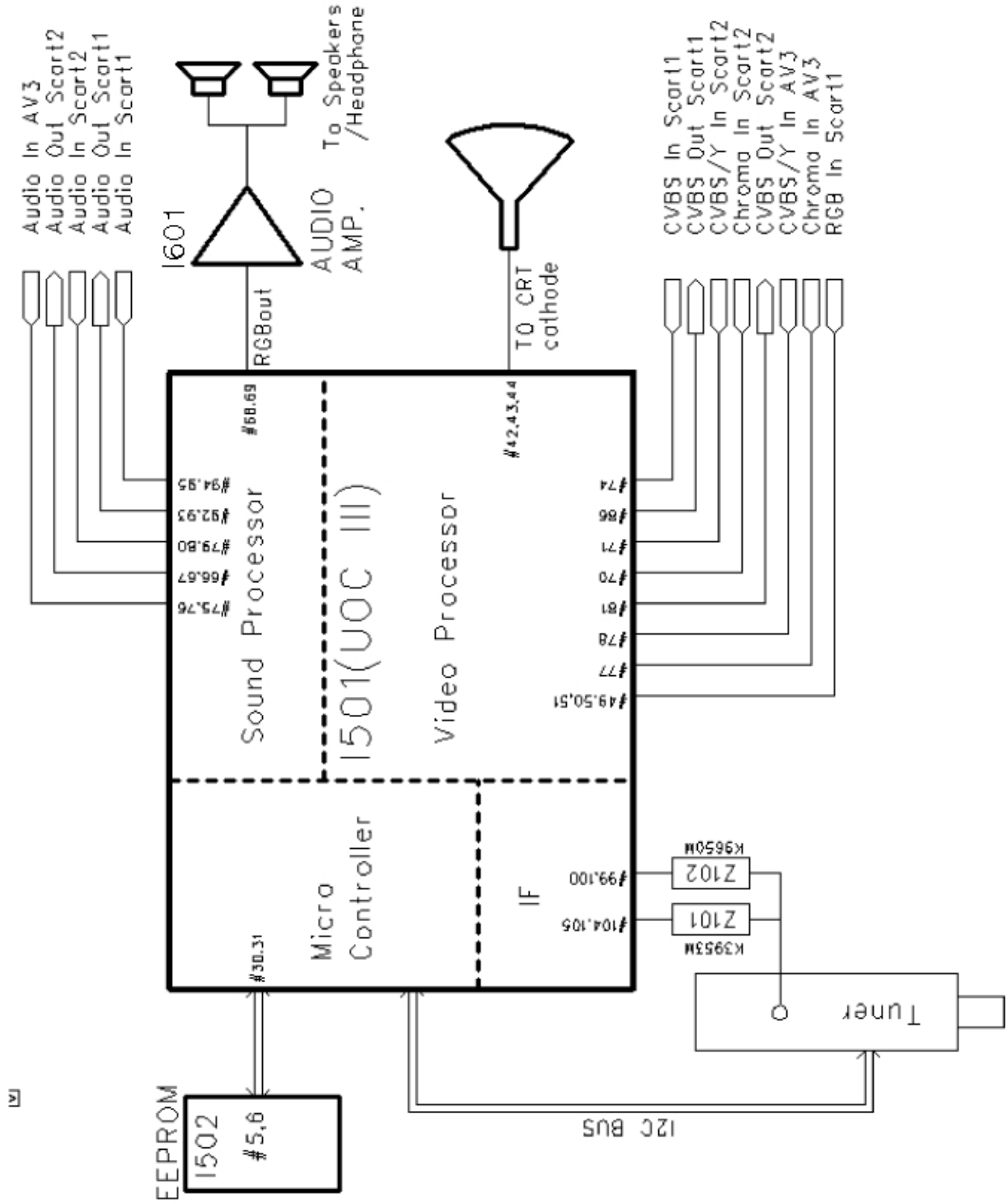
4.5.5 CONTROL PART - ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Start-Up Operation						
Operation Start Voltage	$V_{CC(ON)}$	Turn-on, V_{CC} = 0 → 19.9 V	16.3	18.2	19.9	V
Soft-Start Operation Stop Voltage	$V_{SS/OLP}$		1.1	1.2	1.4	V
Soft-Start Oper. Charging Current	$I_{SS/OLP}$		-390	-550	-710	μA
Operation Stop Voltage	$V_{CC(OFF)}$	Turn-off, V_{CC} = 19.9 → 8.8 V	8.8	9.7	10.6	V
Circuit Current in Non-Operation	$I_{CC(OFF)}$	V_{CC} = 15 V	–	–	100	μA
Normal Operation						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 300 μA	650	–	–	V
Drain Leakage Current	I_{DSS}	V_{DS} = 650 V	–	–	300	μA
On-State Resistance	$r_{DS(on)}$	I_D = 1.9 A, T_J = +25°C	–	–	0.96	Ω
Switching Time	t_f		–	–	400	ns
Circuit Current	$I_{CC(ON)}$		–	–	6.0	mA
Oscillation Frequency	f_{osc}		19	22	25	kHz
Bottom-Skip Oper. Threshold Volt.	$V_{OCPBD(BS1)}$		-605	-665	-720	mV
	$V_{OCPBD(BS2)}$		-385	-435	-485	mV
Quasi-Resonant Oper. Threshold	$V_{OCPBD(TH1)}$		280	400	520	mV
	$V_{OCPBD(TH2)}$		670	800	930	mV
Feedback-Pin Threshold Voltage	$V_{FB(OFF)}$		1.32	1.45	1.58	V
Feedback-Pin Current	$I_{FB(ON)}$		600	1000	1400	μA
Standby Operation						
Standby Operation Start Voltage	$V_{CC(S)}$	V_{CC} = 0 → 12.2 V	10.3	11.1	12.1	V
Standby Oper. Start Volt. Interval	V_{CC}		1.10	1.35	1.65	V
Standby Non-Operation Current	$I_{CC(S)}$	V_{CC} = 10.2 V	–	20	56	μA
Feedback-Pin Current	$I_{FB(ON)}$	V_{CC} = 10.2 V	–	4.0	14	μA
Feedback-Pin Threshold Voltage	$V_{FB(S)}$	V_{CC} = 12.2 V	0.55	1.10	1.50	V
Minimum ON Time	$t_{on(min)}$		0.5	0.8	1.2	μs

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Protection Operation						
OVP Operation Voltage	$V_{CC(OVP)}$	Turn-off, V_{CC} = 0 → 29.9 V	25.5	27.7	29.9	V
Maximum ON Time	$t_{on(max)}$		27.5	32.5	39.0	μs
OLP Operation Voltage	V_{SSOLP}		4.0	4.9	5.8	V
OLP Operation Current	I_{SSOLP}		-6.0	-11	-16	μA
Overcurrent Detect. Threshold Volt.	$V_{OCPBD(LIM)}$		-0.895	-0.940	-0.995	V
OCP/BD-Pin Current	I_{OCPBD}		-40	-100	-250	μA
Latch Holding Current	$I_{CC(H)}$	V_{CC} = 29.9 → $V_{CC(OFF)}$ – 0.3 V	–	45	140	mA
Latch Release Voltage	$V_{CC(L)}$	V_{CC} = 29.9 → 6 V	6.0	7.2	8.5	V
Other						
Thermal Resistance	$R_{\theta JF}$	Output junction-to-frame	–	–	1.6	°C/W

5 CIRCUIT DESCRIPTION

5.1 BLOCK DIAGRAM



5.2 FUNCTIONAL DESCRIPTION OF VIDEO PROCESSOR

5.2.1 Vision IF amplifier

The vision IF amplifier can demodulate signals with positive and megative modulation. The PLL demodulator is completely alignment-free.

The VCO of the PLL circuit is internal and the grequency is fixed to the required value by using the clock ftequency of the TCG u-Controller as a reference. The setting of the various frequencies (e.g. 38, 38.9, 45.75 and 58.75MHz) can be made via the control bits IFA-IFC in subaddress 2FH. Because of the internal VCO the IF circuit has a high immunity to EMC interferences.

The output of the AFC detector can be read from output byte o4H and has a resolution of 7bit(25kHz per step). By means of this information a fast tuning algorithm can be designed.

The IC contains a group delay correction circuit which can be switched between the BG and a uncompensated group delay response characteristic. This hasthe advantage that in multi-standard receivers no compromise has to be made for the choice of the SAW filter. This group delay corection is realised for the demodulated CVBS output signal. The IC contains in addition a sound trap circuit with a switchable centre frequency.

5.2.2 QSS sound circuit

The sound IF amplifier is similar to the vision IF amplifier and has an external AGC decoupling capacitor.

ThesinglereferenceQSSmixerisrealisedbyamultiplier. In this multiplier the SIF signal is converted to the intercarrier frequency by mixing it with the regenerated picture carrier from the VCO. The mixer output signal is suppliedtotheoutputviaahigh-passfilterforattenuation of the residual video signals. With this system a high performance hi-fi stereo sound processing can be achieved.

TheAMsounddemodulatorisrealisedbyamultiplier.The modulated sound IF signal is multiplied in phase with the limited SIF signal. The demodulator output signal is supplied to the output via a low-pass filter for attenuation of the carrier harmonics.

SwitchingbetweentheQSSoutputandAMoutputismade by means of the AM bit in subaddress 33H.

5.2.3 FM demodulator

TheFMdemodulatorisrealisedasnarrow-bandPLL with internal loop filter, which provides the necessary selectivity without using an external band-pass filter. To obtain a good selectivity a linear phase detector and a constant input signal amplitude are required. For this reason the intercarrier signal is internally supplied to the demodulator via a gain controlled amplifier and AGC circuit. To improve the selectivity an internal bandpass filter is connected in front of the PLL circuit.

The nominal frequency of the demodulator is tuned to the required frequency (4.5/5.5/6.0/6.5 MHz) by means of a calibration circuit which uses the clock frequency of the TCG(1)-Controller as a reference. It is also possible to frequencies of 4.72 and 5.74Mhz so that a second sound channel can be demodulated. In the latter application an external bandpass filter has to be

applied to obtain sufficient selectivity (the sound input can be activated by means of the setting of CMB2-CMB0 bits in subaddress 4AH). The setting to the wanted frequency is realised by means of the control bits FMA, FMB and FMC in the control bit 33H.

From the output status bytes it can be read whether the PL Lfrequency is inside or outside the window and whether thePLL is in lock or not. With this information it is possible to make an automatic search system for the incoming sound frequency. This can be realised by means of a software loop which switches the demodulator to the various frequencies and then select the frequency on which a lock condition has been found.

The amplitude deemphasis output signal changed with 6dB by means of the AGN bit. In this way output signal differences between the 4.5 MHz standard (frequency deviation25 kHz) and the other standards (frequency deviation50 kHz) can be compensated.

5.2.4 Audio input selector and volume control

5.2.4.1 STEREO AND AV STEREO VERSIONS

The audio input selector circuit has 4 external stereo inputs, a stereo output for SCART/CINCH and stereo outputs for headphone and audio power amplifiers. The selection is made with the bits SAS2/0, SO2/0 and HPO2/0. AV stereo versions without Audio DSP have no headphone output. The input signal selection for the volumecontrolledaudiooutputsisrealisedbytheHPO2/0 bits.

The gain from an external audio input to each of the (non-controlled) analog output is 0 or +6dB(controlled by the DSG bit). A supply voltage of 5V allows input and output amplitude of 1VRMS full scale, as required to comply with the SCART specification, the audio supply voltage must be 8V. In that case the gain of the audio amplifier must be doubled. This can be realised with the DSG bit in subaddress 32H.

The circuit contains an analogue stereo volume control circuit with a control range of about 70dB. This volume control circuit is used for the headphone channel (stereo versions with Audio DSP) or for the main channel (AV stereo versions without Audio DSP). The analogue control circuit also contains an Automatic Volume Levelling(AVL) function. When this function is activated it stabilises the audio output signal to a certainl evel so that big fluctuations of the output power are prevented.

5.2.4.2 MONO VERSIONS

The audio input selector circuit has 4 inputs for mono signals. The selection is made with the HPO2/0 bits.

The circuit contains an analogue volume control circuit with a control range of about 70dB and an AVL circuit.

5.2.5 CVBS and Y/C input signal selection

5.2.5.1 ALL VERSIONS

The Ics have 3 inputs for external CVBS signals. All CVBS inputs can be used as Y input for the insertion of Y/C signals.However, the CVBS(Y)2 input has to be combined with the C3 input. It is possible to add and extra CVBS(Y/C) input via the pins which are intended to be used for YUV interface (or RGB/YPrPb input). The selection of this additional CVBS(Y/C) input is made via the YC bit.
The function of the IFVO/SVO/CVBSI pin is determined by the SVO1/SVO0 bits. When used as output a selection can be made between the IF video output signal or the selected CVBS signal (monitor out). This pin can also be used as additional CVBS input. This signal is inserted in front of the group delay / sound trap circuit. It is also possible to use the group delay and sound trap circuit for the CVBS2 signal (via the CV2 bit).

For the CVBS(Y/C) inputs the circuit can detect whether a CVBS or Y/C signal is present on the input. The result can be read from the status register (YCD bit in subaddress 03H) and this information can be used to put the input switch in the right position (by means of the INA-IND bits in subaddress 38H). The Y/C detector is only active for the CVBS(Y)3/C3, CVBS(Y)4/C4 and CVBS(Y)x/Cx inputs. It is not active for the CVBS(Y)2/C3 input.

The video ident circuit can be connected to all video input signals. This ident circuit is independent of the synchronisation and can be used to switch the synchronisation and can be used to switch the presence of a video signal (via the VID bit). In this way a very stable OSD can be realised. The result of the video ident circuit can be read from the output bit SID (subaddress 00).

5.2.6 Synchronisation circuit

The IC contains separator circuits for the horizontal and vertical sync pulses. To obtain an accurate timing of the displayed picture the input signal of the sync separator is not derived from the various CVBS/Y or RGB/YPrPb inputs but from the YOUT pin. For this reason the YOUT pin must be capacitively coupled to the YSYNC pin. The delay between the various inputs and the YOUT signal can have rather large differences (e.g. comb filter active or not). By choosing the YOUT signal as input signal for the sync separator these delays have no effect on the picture position. Only for RGB signals without sync on green the input of the sync separator has to be connected to one of the CVBS inputs. This selection is made by means of the SYS bit.

The horizontal drive signal is obtained from an internal VCO which is running at a frequency of 25 MHz. This oscillator is stabilised to this frequency by using the clock signal coming from the reference oscillator of the TCG -Controller.

To obtain a stable On-Screen-Display (OSD) under all conditions it is important that the first control loop is switched off or set to low gain when no signal is available at the input. The input signal condition is detected by the video identification circuit. The video identification circuit can automatically switch first control loop to a low gain when no input signal is available. This mode is obtained when the VID bit is set to “0”. When the VID bit is “1” the mode of the first control loop can be switched by means of the FOA/FOB or POC bits.

For a good performance during normal TV reception (display of the front-end signal) various connections are active between the vision IF amplifier and the synchronisation circuit (e.g. gating pulses for the AGC detector and noise gating of the sync separator). These connections are not allowed when external video signals are displayed. The switching of these connections can be coupled to the input signal selection bits (INA-IND). This mode is obtained when the VDXEN bit is “0”. Due to the input signal selector configuration it is possible that the internal CVBS signal is

available on one of the other CVBS inputs.In this condition the connections between the vision IF amplifier and the synchronisation circuit can be switched on and off by means of the VDX bit. The VDXEN bit must be set to “1” for this mode.

The vertical synchronisation is realised by means of a divider circuit.

5.2.7 Horizontal and vertical drive

The horizontal drive is switched on and off via the soft start/stop procedure. The soft start function is realised by means of variation of the TON of the horizontal drive pulses. During the soft-stop period the horizontal output frequency is doubled resulting in a reduction of the EHT so that the picture tube capacitance can easily be discharged. In addition the horizontal drive circuit has a ‘ low-power start-up’ function.

The vertical ramp generator needs an external resistor and capacitor. For the vertical drive a differential output current is available. The outputs must be DC coupled to the vertical output stage.

The IC has the following geometry control functions:

- Vertical amplitude
- Vertical slope
- S-correction
- Vertical shift
- Vertical zoom
- Vertical scroll
- Vertical linearity correction. When required the linearity setting for the upper and lower part of the screen can have a different setting.
- Horizontal shift
- EW width
- EW parabola width
- EW upper and lower corner parabola correction
- EW trapezium correction
- Horizontal parallelogram and bow correction.

When the East-West geometry function is not required (e.g. for 90 picture tubes) the EW output pin can be used for the connection of the AVL capacitor. This function is chosen by means of the AVLE bit.

5.2.8 Chroma, luminance and feature processing

Someversionscontaina4H/2H(2D)adaptivePAL/NTSC comb filter. The comb filter is automatically activated when standard CVBS signals are received.A signal is considered as “standard signal” when a PAL or NTSC signal is identified and when the vertical divider is in the modes ‘ standard narrow window’ or ‘ standard TV norm’ .For non-standard signals and for SECAM signals the comb filter is bypassed and the signal is filtered by means of bandpass and trap filters.

The chroma band-pass and trap circuits (including the SECAM cloche filter) are realised by means of internal filters and are tuned to the right frequency by comparing the tuning frequency with the reference frequency of the colour decoder.

The circuit contains the following picture improvement features:

- Peaking control circuit. The peaking function can be activated for all incoming CVBS, Y/C and RGB/YPrPb signals. Various parameters of the peaking circuit can be adapted by means of the I2C-bus. The main parameters are:

  - Peaking centre frequency (via the PF1/PF0 bits in subaddress 19H).
  - Ratio of positive and negative peaks (via the RPO1/RPO0 bits in subaddress 47H). The peaks in the direction "white" are the positive peaks.
  - Ratio of pre- and aftershoots (via the RPA1/RPA0 bits in subaddress 47H).
- Video dependent coring in the peaking circuit. The coring can be activated only in the low-light parts of the screen. This effectively reduces noise while having maximum peaking in the bright parts of the picture.
- Black stretch. This function corrects the black level for incoming signals which have a difference between the black level and the blanking level. The amount of stretching (A-A in Fig. 72) and the minimum required back ground to activate the stretching can be set by means of the I2C-bus (BSD/AAS in subaddress 45H).
- Gamma control. When this function is active the transfer characteristic of the luminance amplifier is made non-linear.Thecontrolcurvecanbeadaptedbymeans of I2C-bus settings (see Fig. 74). It is possible to make the gamma control function dependent on the picture content (Average Picture Level, APL). The effect is illustrated in Fig. 75. Previously this function was mentioned under the name "white stretch function".
- Blue-stretch. This circuit is intended to shift colour near ' white' with sufficient contrast values towards more blue to obtain a brighter impression of the picture.
- Dynamic skin tone (flesh) control. This function is realised in the YUV domain by detecting the colours near to the skin tone.
- Scan-Velocity modulation output. Also the SVM function can be activated for all incoming CVBS, Y/C and RGB/YPrPb signals. The delay between the RGB output signals and the SVM output signal can be adjusted (by means of the SVM2-SVM0 bits in subaddress 48H) so that an optimum picture performance can be obtained. Furthermore a coring function can be activated. It is possible to generate Scan Velocity Modulation drive signals during the display of ' full screen' teletext (not in mixed mode). Another feature is that the SVM output signal can be made dependent on the horizontal position on the screen (parabola on the SVM output).

5.2.9 Colour decoder

The ICs decode PAL, NTSC and SECAM signals. The PAL/NTSC decoder does not need external reference crystals but has an internal clock generator which is stabilised to the required frequency by using the clock signal from the reference oscillator of the TCG u -Controller.

Under bad-signal conditions (e.g. VCR-playback n feature mode), it may occur that the colour killer is activated although the colour PLL is still in lock. When this killing action is not wanted it is possible to overrule the colour killer by forcing the colour decoder to the required standard and to activate the FCO-bit (Forced Colour On) in subaddress3CH. The sensitivity of the colour decoder for PAL and NTSC can be increased by means of the setting of the CHSE1/CHSE0 bits in subaddress 3CH.

The Automatic Colour Limiting (ACL) circuit (switchable via the ACL bit in subaddress 3BH) prevents that oversaturation occurs when signals with a high chroma-to-burst ratio are received. The ACL circuit is designed such that it only reduces the chroma signal and not the burst signal. This has the advantage that the colour sensitivity is not affected by this function.

The SECAM decoder contains an auto-calibrating PLL demodulator which has two references, viz: the divided reference frequency (obtained from the-Controller) which is used to tune the PLL to the desired free-running frequency and the bandgap reference to obtain the correct absolute value of the output signal. The VCO of the PLL is calibrated during each vertical blanking period, when the IC is in search or SECAM mode. The frequency offset of the B-Y demodulator can be reduced by means of the SBO1/SBO0 bits in subaddress 3CH.

The base-band delay line is integrated. In devices without CVBS comb filter this delay line is also active during NTSC to obtain a good suppression of cross colour effects. The demodulated colour difference signals are internally supplied to the delay line. The baseband comb filter can be switched off by means of the BPS bit (subaddress 3CH).

The subcarrier output is combined with a 3-level output switch (0 V, 2.1 V and 4.5 V). The output level and the availability of the subcarrier signal is controlled by the CMB2-CMB0 bits.

5.2.10 RGB output circuit

In the RGB control circuit the signal is controlled on contrast, brightness and saturation. The IC has a YUV interface so that additional picture improvement ICs can be applied. To compensate signal delays in the external YUV path the clamp pulse in the control circuit can be shifted by means of the CLD bit in subaddress 44H. When the YUV interface is not required some of the pins can be used for the insertion of RGB/YPrPb signals or as additional CVBS(Y)/C input. When the YUV interface is not used one of the pins (VOUT) is transferred to general purpose output switch (SWO1). The IC has also a YUV interface to th edigita ldie. Via this loop digital features like “ double window” are added.

A tint control is available for the base-band U/V signals. For this reason this tint control can be activated for all colour standards. The signals for OSD and text are internally supplied to the control circuit. The output signal has an amplitude of about 1.2V black-to-white at nominal input signals and nominal settings of the various controls.

To obtain an accurate biasing of the picture tube the ‘ Continuous Cathode Calibration’ system has been included in these ICs. The system is slightly adapted compared with the previous circuits. In the new configuration the cut-off level of the picture tube is controlled with a continuous loop whereas the correction of the amplitude of the output signals is realised by means of a digital loop. As a consequence the current measurement can be controlled from the-Processor. The value of the “ highcurrent” intheCCCloopcanbechosenviatheSLG0 and SLG1 bits (subaddresses 42H and 46H). The gain control in the 3 RGB channels is realised by means of 7-bit DACs. The total gain control range is6 dB. The change in amplitude at the cathodes of the picture tube for one LSB is about 1.1 Vp-p. The setting of the control DAC is determined by the following registers:

- The white point setting of the R, G and B channel in subaddress 20H to 22H. This register has a resolution of 6 bits and the control range in output signal amplitude is +/-3 dB.
- The cathode drive setting (CL3-CL0 in subaddress 42H). This setting is valid for all channels, there solution is 4 bits and the control range is +/-3 dB.
- The gain setting of the R, G and B channel. During switch on this register is loaded with the preset gain setting of subaddress 23H to 25H and when necessary it will be adapted by the CCC control loop. These registers have a resolution of 7 bits. The control of the gain setting is illustrated in table below.

WPR(GB)	‘ 0’	B5	B4	B3	B2	B1	B0	Max 64
CL	‘ 0’	B3	B2	B1	B0	‘ 0’	‘ 0’	Max 60
CCC-gain	B6	B5	B4	B3	B2	B1	B0	Max 126
R(GB)-gain	B6	B5	B4	B3	B2	B1	B0	Max 126

The setting of the gain registers of the 3 channels can be stored during switch off and can be loaded again during switch-on so that the drive conditions are maintained.

When required the operation of the CCC system can be changed into a one-point black current system. The switching between the 2 possibilities is realised by means of the EGL bit (EGL = 0) in subaddress 42H. When used asone-point control loop the system will control the black level of the RGB output signals to the ‘ low’ reference current and not on the cut off point of the cathode. In this way spreads in the picture tube characteristics will not be taken into account. In this condition the settings of the “ white point control registers” (subaddress 20H-22H) and the “ cathode drive level bits” (CL3 - CL0 in subaddress 42H) are added to the settings of the RGB preset gain registers (subaddress 23H - 25H).

A black level off-set can be made with respect to the level which is generated by the black current stabilization system. In this way different colour temperatures can be obtainedforthebrightandthedarkpartofthepicture.The black level control is active on the Red and the Green output signal. It is also possible to control the black level of the Blue and the Green output signal (OFB bit = 1).

In the Vg2 adjustment mode (AVG=1) the black current stabilization system checks the output level of the 3 channels and indicates whether the black level of the highest output is in a certain window(WBC-bit) or below or above this window (HBC-bit). This indication can be read from the status byte 01 and can be used for automatic adjustment of the Vg2 voltage during the production of the TV receiver. During this test the vertical scan remains active so that the indication of the 2 bits can be made visible on the TV screen.

The control circuit contains a beam current limiting circuit and a peak white limiting circuit. The control is realised by means of a reduction of the contrast and brightness control settings. The way of control (first contrast and then brightness or contrast and brightness in parallel) can be chosen by means of the CBS bit (subaddress 44H). The peak white level is adjustable via the I2C-bus.

To prevent that the peak white limiting circuit reacts on the high frequency content of the video signal a low-passfilter is inserted in front of the peak detector. The circuit also contains a soft-clipper which prevents that the high frequency peaks in the output signal become too high. The difference between the peak white limiting level and the soft clipping level is adjustable via the I2C-bus in a few steps.

During switch-off of the TV receiver a fixed beam current is generated by the black current control circuit. This current ensures that the picture tube capacitance is discharged. During the switch-off period the vertical deflection can be placed in an overscan position so that the discharge is not visible on the screen.

A wide blanking pulse can be activated in the RGB outputs by means of the HBL bit in subaddress 43H. The timing of this blanking can be adjusted by means of the bits WBF/R bits in subaddress 26H.

5.2.11 I2C-BUS USER INTERFACE DESCRIPTION

The UOC III series is fully controlled via the I2C-bus. Control is exercised by writing data to one or more internal registers. Status information can be read from a set of info registers to enable the controlling microcontroller determine whether any action is required. The device has an I2C-bus slave transceiver, in accordance with the fast-mode specification, with a maximum speed of 400 kbits/s. Information concerning the I2C-bus can be found in brochure " I2C-bus and how to use it" (order number 939839340011). To avoid conflicts in a real application with other ICs providing similar or complementary functions, there are two possible slave addresses available which can be selected by the SVM pin(pin 65).

Possible slave address

SVM PIN	SLAVE ADDRESS A6 TO A0
Scavem application	1 0 0 0 1 0 1
Tied 5 volts	1 0 0 0 1 1 1

The device will not respond to a ' generalcall' on the I2C-bus, i.e. when a slave address of 0000000 is sent by a master.

Write registers
Each address of the address space (see below) can only be written.
Correct operation is not guaranteed if registers in the range $FB to $FF will be addressed!

Read registers
The output registers of the TV processor are only available via auto-increment mode, no address can be used and all registers must be read.

5.3 GENERAL DESCRIPTION OF THE TV SOUND OF SOUND PROCESSOR

The TV Sound Processor is a digital TV sound processor for analog multi-channel sound systems in TV sets. It is based on a 24 bit DSP and designed to support several applications.

A new easy-to-use control concept was implemented for easiest configuration programming of the very complex functionality of the TV Sound Processor. Pre-defined setups are available for all implemented sound processing modes. Aloud speaker switching concept allows it to adapt the pre-defined setups to the specific loudspeaker application.The built-in intelligence for pre-defined standards and Auto Standard Detection (ASD) allows an easy setup of the demodulator and decoder part.

The control concept for the audio processor is based on the following new features:
- Pre-defined setups for the sound processing modes like Dolby®Pro Logic®and Virtual Dolby®Surround (422, 423)
- Flexible configuration of audio outputs to the loudspeaker configuration with an additional output crossbar
- Master volume function

The control concept for the demodulator and decoder (DEMDEC) is based on the following new features:
- Easy demodulator setup for all implemented standards with Demodulator and Decoder Easy Programming (DDEP) for a pre-selected standard or combined with Auto Standard Detection (ASD) for automatic detection of a transmitted standard

- Automatic decoder configuration and signal routing depending on the selected or detected standard
- FM overmodulation adaptation option to avoid clipping and distortion

5.3.1 Supported standards

The multistandard capability of the TV Sound Processor covers all terrestrial TV sound standards, FM Radio and satellite FM.

The AM sound of L/L' standard is normally demodulated in the 1st sound IF. The resulting AF signal has to been tered into the mono audio input of the TV Sound Processor. A second possibility is to use the AMdemodulator in the DEMDEC part, however this may result in limited performance.

Korea has a stereo sound system similar to Europe. It is supported by the TV Sound Processor. Differences include deviation, modulation contents and identification. It is based on M standard.

Other features of the DEMDEC are:
- M/BTSC and N standards supported
- M/Japan (EIAJ) supported
- FM Radio stereo decoding
- Alignment-free, fully digital system
- For BTSC full dbx®performance
- SAP demodulation (without dbx®) simultaneously with stereo decoding, or mono plus SAP with dbx®
- Line/pilot frequency selectable from 15.734 kHz and 15.625 kHz (or automatic detection / auto search)
- High selectivity for pilot detection, high robustness against high-frequent audio components
- Pilot lock indicator
- SAP detector
- Separate noise detectors for stereo and SAP with adjustable threshold levels, hysteresis, and automute function

An overview of the supported standards and sound systems and their key parameters is given in the following tables.
The analog multi-channel sound systems (A2, A2+ and A2*) are sometimes also named 2CS (2 carrier systems).

ANALOG 2-CARRIER SYSTEMS

[Table] Frequency modulation

STANDARD	SOUND SYSTEM	CARRIER FREQUENCY (MHz)	FM DEVIATION(kHz) NOM./MAX./OVER	MODULATION		BANDWIDTH/ DE-EMPHASIS (kHz/us)
				SC1	SC2	
M	Mono	4.5	15/25/50	Mono	-	15/75
M	A2+	4.5/4.724	15/25/50	1/2(L+R)	1/2(L+R)	15/75(Korea)
B/G	A2	5.5/5.742	27/50/80	1/2(L+R)	R	15/50
I	Mono	6.0	27/50/80	mono	-	15/50
D/K(1)	A2*	6.5/6.258	27/50/80	1/2(L+R)	R	15/50
D/K(2)	A2*	6.5/6.742	27/50/80	1/2(L+R)	R	15/50
D/K(3)	A2*	6.5/5.742	27/50/80	1/2(L+R)	R	15/50

[Table] Identification for A2 systems

PARAMETER	A2/A2*	A2+ (KOREA)
Pilot frequency	54.6875kHz = 3.5 x line freq.	55.0699 kHz = 3.5 x line freq.
Stereo identification frequency	117.5 Hz = line freq / 133	149.9 Hz = line freq / 105
Dual indetification frequency	274.1 Hz = line freq / 57	276.0 Hz = line freq / 57
AM modulation depth	50%	50%

2-CARRIERSYSTEMSWITHNICAM

[Table] NICAM standards

STANDARD	SC1				SC2 (MHz) NICAM	DE-EMPAHSIS	ROLL-OFF (%)	NICAM CODING
	FREQUENCY (MHz)	TYPE	MODULATION					
			INDEX(%) NOM./MAX.	DEVIATION (kHz) NAM./MAX. /OVER				
B/G	5.5	FM	-	27/50/80	5.85	J17	40	Note1
I	6.0	FM	-	27/50/80	6.552	J17	100	Note1
D/K	6.5	FM	-	27/50/80	5.85	J17	40	Note1
L	6.5	AM	54/100	-	5.85	J17	40	Note1

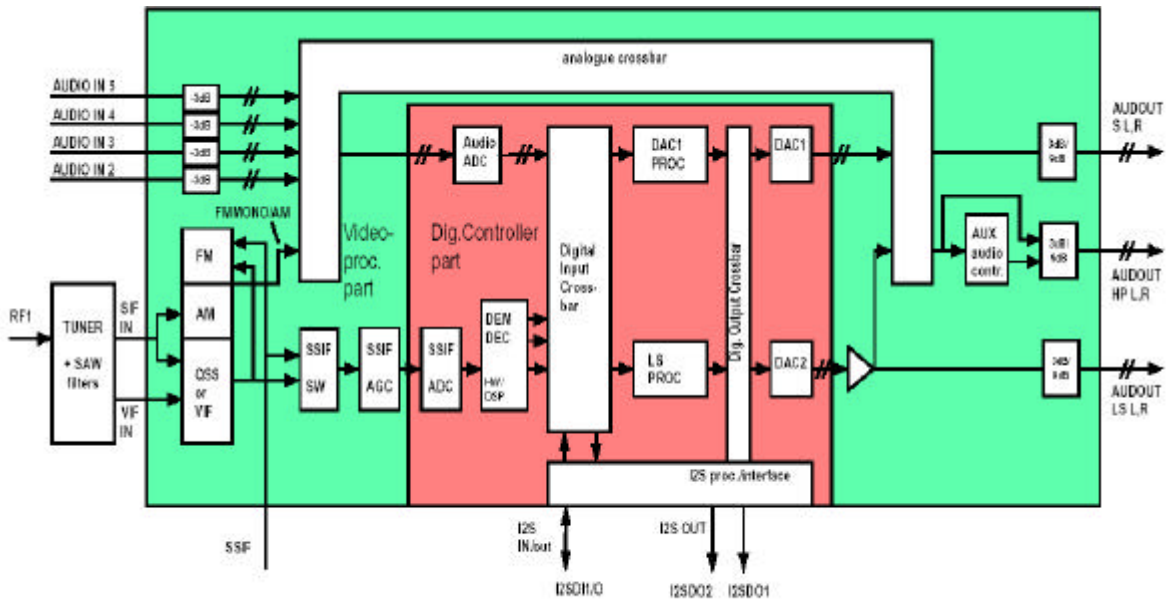
Note 1. See ‘ EBU specification’ or equivalent specification.

5.4 FUNCTIONAL DESCRIPTION SOUND PROCESSOR

5.4.1 The UOC III TV Sound Concept

The UOCIII sound concept is implemented over the video processor and TCG-microcontroller.

Only relevant blocks, functions and signal flows for sound are given.



(only relevant blocks, functions and signal flow for sound are shown)

The tuner receives a RF signal and converts it to IF. Via appropriate SAW filters the SIF signal is delivered to the QSS stage of the video processor and if channels according to standard L/L’ are received also to the AM demodulator. The Quasi Split Sound demodulation generates the SSIF or intercarrier signal. By the SSIF switch it is possible to choose between the internally derived

intercarrier and an external second SIF(2NDSIFEXT), e.g. an intercarrier coming from a PIP frontend. In other applications a 10.7MHz radio IF or satellite FM may be connected to this input. The selected SSIF passes some anti alias filtering, is amplified in an AGC amplifier (SSIF AGC) and is then converted from analogue to digital (SSIF ADC).

The audio signal out of the AM demodulator is connected to the analogue crossbar at the video processor. All other inputs to this multiplexer/audio switch come from external, either from a PIP frontend or SCART/CINCH(AUDINx) or the DAC output signals from the digital controller. The audio AD converters are digitising the audio signals foreseen for further digital processing. One stereo output (AUDOUTS) is available for connections to SCART/CINCH sockets.

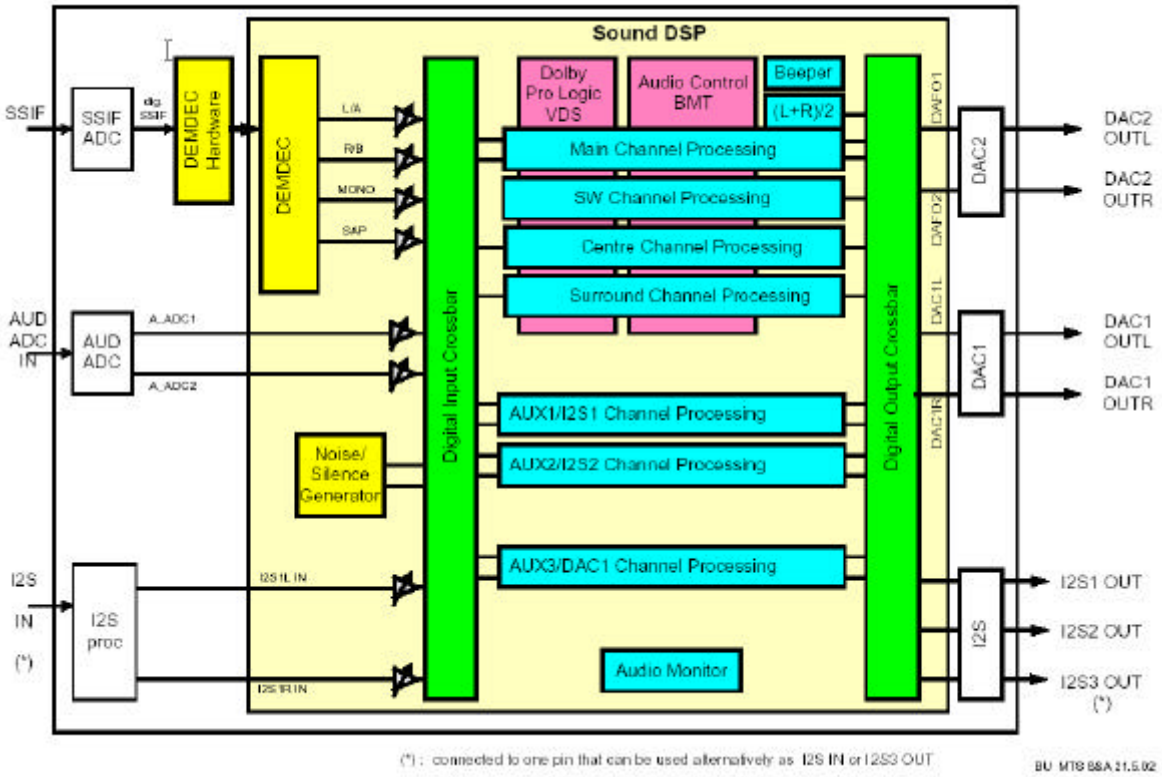
The sound part on the digital controller consists of the demodulator/decoder(DEMDEC), a digital input crossbar, the digital audio processing for the loudspeaker and DAC channels, the I2S processing and interfacing, a digital output crossbar as well as the DA conversion.

An auxiliary audio control (volume control, AUX audio contr.) is available on the video processor. Here it is applied to the headphone channel.

The part of the concept located in the digital controller will be described in the next chapters.

5.4.2 Functional Overview Of the digital controller sound part

The digital controller sound part consists of the SSIFADC, audio ADCs, DEMDEC HW, the sound DSP core, audio DACs and I2S interface hardware as shown in fig below. The DEMDEC part of the Sound DSP is used for the decoder and partly demodulator tasks. The AUDIO part provides the sound features, from the level adjust unit up to the output crossbar. Audio DACs and I2S hardware are converting the processed signals to analogue or digital audio.



The SSIF signal is applied to the SSIF ADC for conversion and is then fed to the DEMDEC hardware processing mainly for demodulation but also some decoding tasks. Remaining

decoding is done in the DEMDEC block of the Sound DSP. The DEMDEC processing will be described in the next chapter.

The audio signals (AUD ADC IN) from the analogue crossbar pass the audio ADC and are fed directly into the AUDIO part of the Sound DSP like the I2S signals, which is coming from I2S processing hardware. After level adjust all signals from the DEMDEC and the I2S input are available at the digital input crossbar. A special input is provided for the Noise/Silence Generator needed for olby®Pro Logic®processing.

In standard TV applications the main channel signal(L,R) will be connected to the DAC2 for reproduction at the speakers. With multichannel signals centre, surround or subwoofer channels may be passed to the I2S outputs where external DACs may be applied. By this it is possible to build Dolby Normal/Wide, Dolby Phantom Centre or Dolby 3 Stereo set-ups and also a VDS423 application.

5.4.3 Demodulator and decoder

INTRODUCTION

The TV sound processor provides an easy-to-use programming interface and built-in intelligence for the demodulator and decoder part.

The sound demodulator is able to search for sound carriers and react to transmission mode changes autonomously, without interaction of the micro controller software.

It is possible for a typical terrestrial TV application to setup the entire demodulator with transmission of few control words.

The control interface still allows access to every detail, called demodulator expert mode, for special applications such as satellite TV, more elaborated search algorithms etc.

The new TV Sound ProcessorDemodulator and DecoderEasyProgramming(DDEP)interfaceprovides three possible approaches to setup the demodulator and decoder parts:

- Auto Standard Detection (ASD)
- Static Standard Selection (SSS)
- Demodulator and Decoder Expert Mode (DDXM)

MIXER

The digitized 2nd SIF input signal is fed to the mixers, which mix one or both input sound carriers down to zero IF. The mixer frequency is derived by the standard setting (Easy Programming) or in the Demodulator and Decoder Expert Mode (DDXM) by a 24-bit control word for each carrier. For NICAM demodulation, a feedback signal is added to the control word of the second carrier mixer to establish a carrier-frequency loop.

FMANDAMDEMODULATION

An FM or AM input signal is fed via a band-limiting filter to a one of two demodulators that can be used for either FM or AM demodulation. Four filters with different bandwidth are available. The

output signal of the first demodulator can be used for further demodulation of multiplex signals used in the BTSC, EIAJ and FM Radio standards.

FMIDENTIFICATION

The identification of the FM sound mode is performed by AM synchronous demodulation of the pilot signal and narrow-band detection of the identification frequencies. The result is available via the control bus interface. A selection can be made for three different modes that represent different trade-offs between speed and reliability of identification. The mode is set by DDEP (for FM two-carrier standards) or via expert mode. DDEP also performs automatic FM de-matrix control in dependence on the identification.

FM/AMDECODING

A high-pass filter suppresses DC offsets from the FM/AM demodulators due to carrier frequency offsets and supplies the monitor/peak function with DC values and an un-filtered signal, e.g. for the purpose of carrier detection.

The audio bandwidth is approx. 15 kHz.

The de-emphasis function offers fixed settings for the supported standards (50s, 60s, 75s and J17).

A matrix performs the de-matrixing of the A2 stereo, dual and mono signals to obtain the left (L) and right (R) or language A and B signals.

FMPILOTCARRIERPRESENTDETECTOR

The TV Sound Processor provides FM A2 standard pilot carrier detection.

NICAMDEMODULATION

The NICAM signal is transmitted via DQPSK modulation at a bit rate of 728kBit/s. The NICAM demodulator performs DQPSK demodulation and feeds the resulting bit stream and clock signal to the NICAM decoder.

A timing loop controls the sample rate conversion circuitry to lock the sampling rate to the symbol timing of the NICAM data.

NICAM DECODER

The NICAM decoder performs all decoding functions in accordance with theEBU NICAM 728 specification. After locking to the frame alignment word, the data is de scrambled by applying the defined pseudo-random binary sequence; the NICAM decoder will then synchronize to the periodic frame flag bitC0.

The status of the NICAM decoder can be read out from the NICAM status register by the user (see the control-bus register description). The OSB bit indicates that the decoder has locked to the NICAM data. The VDSP bit indicates that the decoder has locked to the NICAM data and that the data is valid sound data. The C4 bit indicates that the sound conveyed by the FM mono channel is identical to the sound conveyed by the NICAM channel. The error byte contains the

number of sound sample errors, resulting from parity checking, that occurred in the past 128ms period. The Bit Error Rate (BER) can be calculated using the following equation;

$$BER = \frac{\text{bit errors}}{\text{total bits}} \approx \text{error byte} \times 1.74 \times 10^{-5}$$

During NICAM mode a switchable J17 de-emphasis is supplied.

NICAM AUTO-MUTE

If the Auto Standard Detection (ASD) or the Static Standard Detection (SSS) feature is activated the following auto mute function is in effect.

If NICAM B/G, I, D/K is received, the auto-mute is enabled and the signal quality becomes poor, the built-in control automatically switches the output signal (DEC output) to FM channel 1. The automatic switching depends on the NICAM bit error rate. The auto-mute function can be disabled via the control bus.

This function is enabled by setting bit NIC_AMUTE to 0. Upper and lower error limits may be defined by writing appropriate values to the corresponding control bits (NICLOERRLIM and NICUPERRLIM). When the number of errors in a 128 ms period exceeds the upper error limit the auto-mute function will switch the output sound from NICAMtowhateversoundisonthefirstsoundcarrier(FM or AM). When the error count is smaller than the lower error limit the NICAM sound is restored.

The auto-mute function can be disabled by setting bit NIC_AMUTE to 1. In this condition clicks become audible when the error count increases; the user will hear a signal of degrading quality.

For NICAM L applications, it is recommended to demodulate AM sound in the first sound IF. The demodulated AM is provided by the internal IF processor. For applications with external IF processing the external demodulated AM signal can be connected to the SCART/Mono input of the TV Sound Processor. By setting the EXTAM bit, the auto-mute function will switch to the audio ADC input signal named EXTAM instead of switching to the first sound carrier. The ADC source selector should be set to internal AM mono signal or to the external SCART/mono input, where the AM sound signal should be connected.

6. SERVICE PARTS LIST

Caution : In this Service Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center(http://svc.dwe.co.kr)

6.1 DTX-21G2FZP-SB

z_loc	z_parts_code	parts_name	parts_descr	remark
ZZ100	PTACPWE519	ACCESSORY AS	DTX-21G2FZS-SB	
12000	48B5849C1001	TRANSMITTER REMOCON	R-49C10	
13000	4850Q00910	BATTERY	AAA R03 SUPERGARD/ROCKET	
14000	4858213801	BAG INSTRUCTION	L. D. P. E. T0. 05X250X400	
ZZ120	PTBCSHE519	COVER BACK AS	DTX-21G2FZS-SB	
M211	4852172311G	COVER BACK	21G2 HIPS GY8301A	
M541	4855415800	S/PLATE	150ART P/E FILM (C/TV)	
M542	4855800022P1	LABEL SERIAL	ART 90 55X34	
ZZ130	PTCACAE524	CABINET AS	DTX-21G2FZP-SB	
20	2193110002	SOLDER WIRE	SN-3.0AG-0.5CU (DHB-RMA3)	
40	4856812001	TIE CABLE	NYLON66 DA100	
M191	4851954300	DOOR AS	21G2 GY340A+SV128BP/PC	
M201A	4856017703	SCREW CRT FIX	5X30 L80 BK 3CR	
M201B	4856215402	WASHER RUBBER	20"	
M201C	4856017710	SCREW CRT FIX	5X30 L190 BK 3CR	
M211A	7172401652	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK 3CR	
M211B	7178301052	SCREW TAPPTITE	TT2 WAS 3X10 MFZN BK 3CR	
M231A	7172401252	SCREW TAPPTITE	TT2 TRS 4X12 MFZN BK 3CR	
M481	4854869711	BUTTON POWER	21G2 ABS GY340A+SV128BP	
M481A	4856715600	SPRING	14A5 SWPA	
M501	485506202001	DECO CTRL	21G2 PC T0.25	
M561	48556192SD02	MARK BRAND	"DAEWOO 68MM (20""21"")"	
M781	4857817610	CLOTH BLACK	"300 MM 20""	
M791	4857923300	DOOR LOCK	LA701 (KIFCO)	
PWC1	4859903110	CORD POWER	W/F 6-LO (LOMAX)	
SP01A	7172401252	SCREW TAPPTITE	TT2 TRS 4X12 MFZN BK 3CR	
SP02A	7172401252	SCREW TAPPTITE	TT2 TRS 4X12 MFZN BK 3CR	
V901	4859640060	"CRT (THOMSON 21"")"	A51ELD032X001	
ZZ131	58G0000177	COIL DEGAUSSING	DC-21SF AL	
ZZ132	48519A7610	CRT GROUND AS	2103S-1015-1P	
ZZ200	PTFMSJY21G2S	MASK FRONT AS	DTY-21G2 SV128BP	
M231	4852330711	PANEL FRONT	21G2 HIPS BK+GY8204BP	
M801	4852090511S	MASK FRONT	21G2 GY340A	
ZZ210	PTSPPWE519	SPEAKER AS	DTX-21G2FZS-SB	
P601A	4850704S28	CONN AS	YH025-04+35089+ULW=600	
SP01	4858317410	SPEAKER	SP-58126FC	
SP02	4858317410	SPEAKER	SP-58126FC	
ZZ290	PTMPMSE524	PCB MAIN MANUAL AS	DTX-21G2FZP-SB	
10	2193110001	SOLDER WIRE	SN-3.0AG (NP303T) 3.0	
20	2193110002	SOLDER WIRE	SN-3.0AG-0.5CU (DHB-RMA3)	
30	2291050617P	FLUX SOLDER	CF-329D	
40	2291050314	FLUX SOLVENT	IM-1000	
C403	CMYH3C662H	C MYLAR	1.6KV BUP 6600PF H	
C407	CMXF2E224J	C MYLAR	250V MPU 0.22MF J	
C408	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
C626	CEXF1C102V	C ELECTRO	16V RSS 1000MF (10X20) TP	
C801	CL1UC3474M	C LINE ACROSS	0.47MF 1J(UCVSNDF/SV	
C804	CEYD2G181D	C ELECTRO	400V FHS 180MF	
C805	CCXR3D681K	C CERA	2KV R 680PF K 125C	
C811	CH1BFE222M	C CERA AC	U/C/V AC400V 2200PF	
C812	CCXB3D471K	C CERA	2KV B 470PF K (TAPPING)	
C813	CEXF2C101V	C ELECTRO	160V RSS 100MF (16X25) TP	
C814	CEXF2C470V	C ELECTRO	160V RSS 47MF (13X25) TP	
C816	CEXF1C102V	C ELECTRO	16V RSS 1000MF (10X20) TP	
C818	CEXF1C222V	C ELECTRO	16V RSS 2200MF(13X25)TP	
C827	CCXB3D471K	C CERA	2KV B 470PF K (TAPPING)	
D707	DLH3PRG03-	LED BLOCK	LH-3P-RG-03	
F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	
HP01	4859102130	JACK EARPHONE	YSC-1537	
I301	1LA78040—	IC VERTICAL	LA78040	
I301A	4857027100	HEAT SINK	SPCC T1.0+SN	
I301B	7174300851	SCREW TAPPTITE	TT2 RND 3X8 MFZN 3CR	
I502	124LC16B1B	IC MEMORY	24LC16B1B	
I601	1LA42032E-	IC AUDIO AMP	LA42032-E	
I601A	4857024401	HEAT SINK	AL EX (NO ANODIZING)	
I601B	7174300851	SCREW TAPPTITE	TT2 RND 3X8 MFZN 3CR	
I801	1STRW6754-	IC POWER	STR-W6754	
I801A	4857024600	HEAT SINK	AL EX B/K	
I801B	7174300851	SCREW TAPPTITE	TT2 RND 3X8 MFZN 3CR	
I802	1LTV817C—	IC PHOTO COUPLER	LTV-817C	

z_loc	z_parts_code	parts_name	parts_descr	remark
I804	1LE33CZ---	IC REGULATOR	LE33CZ	
IF01	1441VF6---	IC PREAMP	441VF6	
JPA01	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA02	4859200401	SOCKET RGB	SR-21A1 (ANGLE TYPE)	
JPA03	4859108450	JACK PIN BOARD	YSC03P-4120-14A	
L401	58H0000020	COIL H-LINEARITY	L-76(76.5UH)	
LF801	5PLF24A1—	FILTER LINE	LF-24A1	
P401	4850705N14	CONNECTOR	BIC-05T-25T+ULW=500	
P402	4859242420	CONN WAFER	YFW800-04	
P501	4850705N14	CONNECTOR	BIC-05T-25T+ULW=500	
P601	4859231720	CONN WAFER	YW025-04	
P701	4859231720	CONN WAFER	YW025-04	
P801	4859242220	CONN WAFER	YFW800-02	
P802	4859242220	CONN WAFER	YFW800-02	
Q402	TST1803DFH	TR HORI	ST1803DFH	
Q402A	4857027201	HEAT SINK	AL T1.0	
Q402B	7174301051	SCREW TAPPTITE	TT2 RND 3X10 MFZN 3CR	
R311	RS02Y229JS	R M-OXIDE FILM	2W 2.2 OHM J SMALL	
R406	RS02Y103JS	R M-OXIDE FILM	2W 10K OHM J SMALL	
R407	RS02Y102JS	R M-OXIDE FILM	2W 1K OHM J SMALL	
R411	RS02Y109JS	R M-OXIDE FILM	2W 1 OHM J SMALL	
R800	RX07B229JP	R CEMENT	7W 2.2 OHM J BEN 15MM 4P	
R801	DTC7R0M270	POSISTOR	PDC7R0MP6B7Z81C	
R805	RS02Y228JS	R M-OXIDE FILM	2W 0.22 OHM J SMALL	
SCT01	4859304130	SOCKET CRT	ISHG93S	
SW801	5S40101143	SW PUSH	PS3-22SP (P.C.B)	
T401	50D10A3---	TRANS DRIVE	TD-10A3	
T402	50H0000310	FBT	LTC-565	
T801	50M3541C4-	TRANS SMPS	TSM-3541C4	
U100	4859730330	TUNER VARACTOR	TAEM-G010D	
X501	5XJ24R576E	CRYSTAL QUARTZ	HC-49/S 24.576MHZ 30PPM	
Z101	5PK3953M—	FILTER SAW	K3953M	
Z102	5PK9650M—	FILTER SAW	K9650M	
ZZ200	PTMPJBE520	PCB MAIN EYE LET AS	DTX-21U7FZS	
E01	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E02	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E03	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E05	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E06	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E08	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E09	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E10	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E11	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E12	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E13	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E14	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E15	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E16	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E17	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E18	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E19	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E20	4856310300	EYE LET	BSR T0.2 (R1.6) SMALL	
E21	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E22	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E23	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E24	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
E25	4856310600	EYE LET	BSR 2.3(R2.3) BIG	
ZZ200	PTMPJ2E520	PCB CHIP MOUNT B AS	DTX-21U7FZS	
I501	1TDA20HF01	IC MICOM FLASH	TDA12020H1/N1/F01	
ZZ200	PTMPJRE520	PCB MAIN RADIAL AS	DTX-21U7FZS	
C101	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C102	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C105	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C106	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C302	CEXF1H101V	C ELECTRO	50V RSS 100MF (8*11.5) TP	
C305	CEXF1C331V	C ELECTRO	16V RSS 330MF (8X11.5) TP	
C306	CEXF1C331V	C ELECTRO	16V RSS 330MF (8X11.5) TP	
C307	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C401	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C402	CCXB2H102K	C CERA	500V B 1000PF K (TAPPING)	

z_loc	z_parts_code	parts_name	parts_descr	remark
C405	CCXB2H561K	C CERA	500V B 560PF K (TAPPING)	
C406	CEXF2C109V	C ELECTRO	160V RSS 1MF (6.3*11) TP	
C409	CXSL2H470J	C CERA	500V SL 47PF J (TAPPING)	
C410	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C501	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C502	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C505	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C507	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C508	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C509	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C510	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C511	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C513	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C514	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C515	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C516	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C517	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C518	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C519	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C520	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C521	CMXM2A222J	C MYLAR	100V 2200PF J TP	
C522	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C524	CMXM2A682J	C MYLAR	100V 6800PF J TP	
C525	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C526	CMXL1J224J	C MYLAR	63V MEU 0.22MF J TP	
C527	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C528	CCXF1H223Z	C CERA	50V F 0.022MF Z (TAPPING)	
C529	CMXL1J154J	C MYLAR	63V MEU 0.15MF J	
C534	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C535	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C536	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C537	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C538	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C539	CMXM2A332J	C MYLAR	100V 3300PF J TP	
C540	CMXM2A473J	C MYLAR	100V 0.047MF J TP	
C542	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C543	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C545	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C547	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C548	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C549	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C552	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C553	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C554	CMXL1J474J	C MYLAR	63V 0.47MF MKT	
C556	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C558	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C560	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C561	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C562	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C563	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C567	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C568	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C569	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C574	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C576	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C577	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C579	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C581	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C601	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C602	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C603	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C609	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C610	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C611	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C625	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5*11) TP	
C802	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C806	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C807	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C815	CEXF2A100V	C ELECTRO	100V RSS 10MF (6.3X11) TP	
C817	CEXF1A471V	C ELECTRO	10V RSS 470MF(TAPPING)	
C819	CEXF2C109V	C ELECTRO	160V RSS 1MF (6.3*11) TP	
C820	CMXM2A104J	C MYLAR	100V 0.1MF J TP	
C821	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C824	CEXF1A471V	C ELECTRO	10V RSS 470MF(TAPPING)	
C833	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C834	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C835	CEXF1C471V	C ELECTRO	16V RSS 470MF (10X12.5)TP	
C904	CCXB3A271K	C CERA	1KV B 270PF K (TAPPING)	
CA10	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
F801A	4857415001	CLIP FUSE	PFC5000-0702	

z_loc	z_parts_code	parts_name	parts_descr	remark
F801B	4857415001	CLIP FUSE	PFC5000-0702	
I803	1K1A431B—	IC REGULATOR(SHUNT)	KIA431B 2.495V 0.5% TO-92	
I805	1K1A431B—	IC REGULATOR(SHUNT)	KIA431B 2.495V 0.5% TO-92	
L517	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L518	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L519	5CPX479K—	COIL PEAKING	4.7UH K RADIAL	
L802	58CX430599	COIL CHOKE	AZ-9004Y 940K TP	
Q101	T2SC5343Y-	TR	2SC5343Y	
Q401	TKTC3207—	TR	KTC3207	
Q501	T2SC5343Y-	TR	2SC5343Y	
Q502	T2SA1980Y-	TR	2SA1980Y	
Q503	T2SC5343Y-	TR	2SC5343Y	
Q504	T2SA1980Y-	TR	2SA1980Y	
Q506	T2SC5343Y-	TR	2SC5343Y	
Q507	T2SA1980Y-	TR	2SA1980Y	
Q508	T2SC5343Y-	TR	2SC5343Y	
Q513	T2SA1980Y-	TR	2SA1980Y	
Q514	TH2N7000—	TR	H2N7000	
Q515	TH2N7000—	TR	H2N7000	
Q601	T2SA1980Y-	TR	2SA1980Y	
Q602	T2SC5343Y-	TR	2SC5343Y	
Q801	T2SC5343Y-	TR	2SC5343Y	
Q802	T2SC5343Y-	TR	2SC5343Y	
Q803	T2SC5343Y-	TR	2SC5343Y	
Q804	TKTA1270Y-	TR	KTA1270Y	
Q805	TKTA1270Y-	TR	KTA1270Y	
Q806	T2SC5343Y-	TR	2SC5343Y	
Q807	TKTA1270Y-	TR	KTA1270Y	
Q808	T2SC5343Y-	TR	2SC5343Y	
Q809	TKTC3202Y-	TR	KTC3202Y	
Q901	TKTC3207—	TR	KTC3207	
Q902	TKTC3207—	TR	KTC3207	
Q903	TKTC3207—	TR	KTC3207	
Q904	TBF420——	TR	BF420	
Q905	TBF420——	TR	BF420	
Q906	TBF420——	TR	BF420	
Q907	TBF421——	TR	BF421	
Q908	TBF421——	TR	BF421	
Q909	TBF421——	TR	BF421	
R823	RN02B390JS	R METAL FILM	2W 39 OHM J SMALL	
R836	RN02B390JS	R METAL FILM	2W 39 OHM J SMALL	
R837	RN02B100JS	R METAL FILM	2W 10 OHM J SMALL	
R838	RN02B240JS	R METAL FILM	2W 24 OHM J SMALL	
R904	RN02B123JS	R METAL FILM	2W 12K OHM J SMALL	
R905	RN02B123JS	R METAL FILM	2W 12K OHM J SMALL	
R906	RN02B123JS	R METAL FILM	2W 12K OHM J SMALL	
R910	RN01B680JS	R METAL FILM	1W 68 OHM J SMALL	
SW700	5S50101090	SW TACT	SKHV17910A	
SW701	5S50101090	SW TACT	SKHV17910A	
SW702	5S50101090	SW TACT	SKHV17910A	
SW703	5S50101090	SW TACT	SKHV17910A	
SW704	5S50101090	SW TACT	SKHV17910A	
Z603	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z604	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z605	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z606	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z607	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z608	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z609	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z610	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z611	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z612	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZZ200	PTMPJAE520	PCB MAIN AXIAL AS	DTX-21U7FZS	
10	2TM14006LB	TAPE MASKING	3M #232 6.0X2000M (WITH GLUE)	
20	2TM10006LB	TAPE MASKING	3M #232-MAP-C 6.2X2000M (W/O GLUE)	
A001	4859813693	PCB MAIN	CP-520V (DTX) 330X246(1X1)T1.6	
C107	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C123	CCZL1H472K	C CERA	50V B 4700PF K AXL (1608)	
C301	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C310	CCZJ1H473Z	C CERA	50V F 0.047MF Z AXL (1608)	
C412	CCZJ1H473Z	C CERA	50V F 0.047MF Z AXL (1608)	
C503	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C504	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C512	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C523	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C530	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
C531	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C532	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C533	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C541	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C544	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	

z_loc	z_parts_code	parts_name	parts_descr	remark
C546	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C550	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C551	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C555	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C557	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C564	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C565	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C566	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C575	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C578	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C589	CCZL1H472K	C CERA	50V B 4700PF K AXL (1608)	
C590	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C591	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C592	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C605	CBZR1C472M	C CERA	Y5R 16V 4700PF M AXIAL	
C606	CBZR1C472M	C CERA	Y5R 16V 4700PF M AXIAL	
C612	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C613	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C614	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C615	CCZJ1H104Z	C CERA	50V F 0.1MF Z AXL (1608)	
C616	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C617	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C618	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C619	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C701	CCZJ1H103Z	C CERA	50V F 0.01MF Z AXL (1608)	
C808	CCZB1H471K	C CERA	50V B 470PF K (AXIAL)	
C809	CCZJ1H473Z	C CERA	50V F 0.047MF Z AXL (1608)	
C810	CCZB1H821K	C CERA	50V B 820PF K (AXIAL)	
C828	CCZB1H561K	C CERA	50V B 560PF K (AXIAL)	
C901	CCZB1H331K	C CERA	50V B 330PF K (AXIAL)	
C902	CCZB1H331K	C CERA	50V B 330PF K (AXIAL)	
C903	CCZB1H331K	C CERA	50V B 330PF K (AXIAL)	
CA01	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA02	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA03	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA04	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA05	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA06	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA28	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
D101	DUZ33B——	DIODE ZENER	UZ-33B	
D102	DBA282——	DIODE	BA282	
D103	D1N4148—-	DIODE	1N4148 (TAPPING)	
D104	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
D301	D1N4004S—	DIODE	1N4004S	
D302	D1N4937G—	DIODE	1N4937G	
D303	D1N4937G—	DIODE	1N4937G	
D401	D1N4937G—	DIODE	1N4937G	
D402	D1N4148—-	DIODE	1N4148 (TAPPING)	
D403	D1N4148—-	DIODE	1N4148 (TAPPING)	
D404	D1N4937G—	DIODE	1N4937G	
D501	D1N4148—-	DIODE	1N4148 (TAPPING)	
D502	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
D503	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
D522	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
D523	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
D524	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
D525	DTZX6V2—-	DIODE ZENER	TZX6V2B (TAPPING)	
D526	DTZX6V2—-	DIODE ZENER	TZX6V2B (TAPPING)	
D527	DTZX6V2—-	DIODE ZENER	TZX6V2B (TAPPING)	
D601	D1N4148—-	DIODE	1N4148 (TAPPING)	
D602	D1N4148—-	DIODE	1N4148 (TAPPING)	
D801	DLT2A05G—	DIODE	LT2A05G	
D802	DLT2A05G—	DIODE	LT2A05G	
D803	DLT2A05G—	DIODE	LT2A05G	
D804	DLT2A05G—	DIODE	LT2A05G	
D805	D1N4937G—	DIODE	1N4937G	
D806	D1N4937G—	DIODE	1N4937G	
D807	D1N4148—-	DIODE	1N4148 (TAPPING)	
D808	DTZX6V2—-	DIODE ZENER	TZX6V2B (TAPPING)	
D809	DRGP15J—-	DIODE	RGP15J	
D811	D1N4937G—	DIODE	1N4937G	
D812	DRGP15J—-	DIODE	RGP15J	
D817	DRGP15J—-	DIODE	RGP15J	
D817B	DRGP15J—-	DIODE	RGP15J	
D818	DTZX4V3B—	DIODE ZENER	TZX4V3B (TAPPING)	
D819	DRGP15J—-	DIODE	RGP15J	
D820	DTZX2V4A—	DIODE ZENER	TZX2V4A (TAPPING)	
D821	DTZX2V4A—	DIODE ZENER	TZX2V4A (TAPPING)	
D902	D1N4148—-	DIODE	1N4148 (TAPPING)	
DA01	85801060GY	WIRE COPPER	1/0.6 TIN COATING	

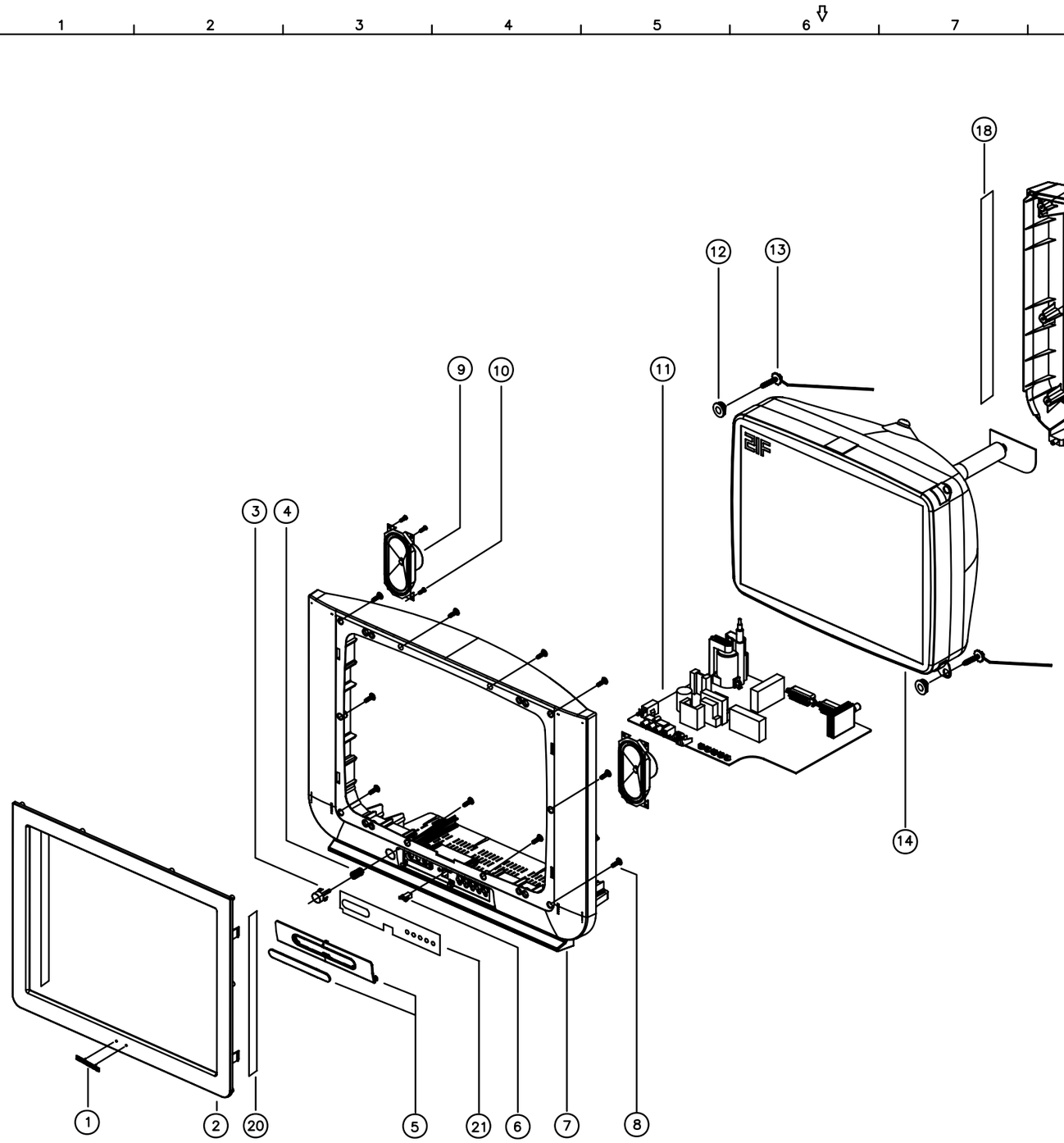
z_loc	z_parts_code	parts_name	parts_descr	remark
DA02	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA03	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
DA04	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA06	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA08	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA09	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA10	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA11	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA13	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA14	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA15	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA16	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA20	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA21	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DA22	DTZX5V6B—	DIODE ZENER	TZX5V6B (TAPPING)	
DF01	DTZX3V9B—	DIODE ZENER	TZX3V9B (TAPPING)	
J001	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J002	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J003	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J004	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J005	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J006	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J007	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J008	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J009	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J010	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J011	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J012	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J013	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J014	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J015	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J016	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J017	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J018	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J019	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J020	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J021	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J022	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J023	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J024	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J025	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J026	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J027	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J028	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J029	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J030	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J031	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J032	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J034	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J035	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J037	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J038	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J039	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J040	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J041	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J043	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J044	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J045	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J046	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J047	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J048	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J049	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J050	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J051	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J052	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J053	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J054	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J055	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J056	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J057	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J058	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J059	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J061	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J062	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J063	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J065	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J066	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J067	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J068	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J069	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J070	85801060GY	WIRE COPPER	1/0.6 TIN COATING	

z_loc	z_parts_code	parts_name	parts_descr	remark
J071	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J072	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J073	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J074	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J075	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J076	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J078	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J079	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J080	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J081	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J083	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J084	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J085	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J086	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J088	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J089	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J091	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J094	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J095	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J096	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J097	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J098	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J099	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J100	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J101	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J102	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J103	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J104	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J105	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J106	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J107	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J108	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J109	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J110	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J111	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J112	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J113	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J114	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J115	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J116	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J117	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J118	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J119	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J120	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J121	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J122	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J123	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J124	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J125	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J126	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J127	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J128	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J129	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J131	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J132	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J133	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J134	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J136	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J137	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J204	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J205	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J206	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J500	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J900	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
L101	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L301	5MC0000100	COIL BEAD	MD-5 (HC-3550)	
L505	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L506	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L507	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L508	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L509	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L510	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L512	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L513	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L514	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L515	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L516	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L523	5CPZ479K02	COIL PEAKING	4.7UH 3.5MM K (LAL02TB)	
L601	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L602	5CPZ100K02	COIL PEAKING	10UH 3.5MM K (LAL02TB)	
L801	5MC0000100	COIL BEAD	MD-5 (HC-3550)	

z_loc	z_parts_code	parts_name	parts_descr	remark
R101	RD-2Z332J-	R CARBON FILM	1/2 3.3K OHM J	
R104	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R105	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R106	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R107	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R108	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R109	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R110	RD-AZ683J-	R CARBON FILM	1/6 68K OHM J	
R115	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R116	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R301	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R302	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R303	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R304	RD-AZ152J-	R CARBON FILM	1/6 1.5K OHM J	
R305	RD-4Z279J-	R CARBON FILM	1/4 2.7 OHM J	
R306	RD-4Z279J-	R CARBON FILM	1/4 2.7 OHM J	
R308	RN-4Z1501F	R METAL FILM	1/4 1.5K OHM F	
R310	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R312	RD-2Z561J-	R CARBON FILM	1/2 560 OHM J	
R401	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R402	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R403	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
R404	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R408	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R409	RD-4Z103J-	R CARBON FILM	1/4 10K OHM J	
R410	RD-4Z103J-	R CARBON FILM	1/4 10K OHM J	
R412	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R413	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R421	RD-4Z182J-	R CARBON FILM	1/4 1.8K OHM J	
R501	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R502	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R503	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R504	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R505	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R506	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R507	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R508	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R510	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R511	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R512	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R514	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R515	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R516	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R517	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R518	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R519	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R520	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R527	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R528	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R529	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R530	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R531	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R532	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R533	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R534	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R537	RD-AZ183J-	R CARBON FILM	1/6 18K OHM J	
R539	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R540	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R541	RN-AZ3902F	R METAL FILM	1/6 39K OHM F	
R542	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R543	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R544	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R545	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R546	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R547	RD-AZ563J-	R CARBON FILM	1/6 56K OHM J	
R550	RD-4Z562J-	R CARBON FILM	1/4 5.6K OHM J	
R551	RD-AZ823J-	R CARBON FILM	1/6 82K OHM J	
R552	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R553	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R554	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R555	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R556	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R557	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R558	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R559	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R560	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R561	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R562	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R563	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R564	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	

z_loc	z_parts_code	parts_name	parts_descr	remark
R565	RD-AZ154J-	R CARBON FILM	1/6 150K OHM J	
R566	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R567	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R568	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R569	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R571	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R572	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R573	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R574	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R575	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R576	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R577	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R578	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R579	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R580	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R582	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R583	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R584	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R585	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R586	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R587	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R588	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R589	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R590	RD-AZ334J-	R CARBON FILM	1/6 330K OHM J	
R598	RD-AZ182J-	R CARBON FILM	1/6 1.8K OHM J	
R599	RD-AZ224J-	R CARBON FILM	1/6 220K OHM J	
R605	RD-AZ132J-	R CARBON FILM	1/6 1.3K OHM J	
R606	RD-AZ132J-	R CARBON FILM	1/6 1.3K OHM J	
R607	RD-AZ512J-	R CARBON FILM	1/6 5.1K OHM J	
R608	RD-AZ202J-	R CARBON FILM	1/6 2K OHM J	
R609	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R610	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R611	RD-4Z301J-	R CARBON FILM	1/4 300 OHM J	
R612	RD-4Z301J-	R CARBON FILM	1/4 300 OHM J	
R613	RD-AZ829J-	R CARBON FILM	1/6 8.2 OHM J	
R614	RD-AZ829J-	R CARBON FILM	1/6 8.2 OHM J	
R615	RD-AZ829J-	R CARBON FILM	1/6 8.2 OHM J	
R616	RD-AZ474J-	R CARBON FILM	1/6 470K OHM J	
R617	RD-AZ829J-	R CARBON FILM	1/6 8.2 OHM J	
R618	RD-AZ474J-	R CARBON FILM	1/6 470K OHM J	
R619	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R620	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R701	RN-AZ1002F	R METAL FILM	1/6 10K OHM F	
R702	RN-AZ1502F	R METAL FILM	1/6 15K OHM F	
R703	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R704	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R713	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R720	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R721	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R722	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R723	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R724	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R804	RD-2Z104J-	R CARBON FILM	1/2 100K OHM J	
R806	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R807	RD-AZ152J-	R CARBON FILM	1/6 1.5K OHM J	
R808	RD-4Z221J-	R CARBON FILM	1/4 220 OHM J	
R809	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R810	RC-2Z565KP	R CARBON COMP	1/2 5.6M OHM K	
R811	RN-4Z9102F	R METAL FILM	1/4 91.0K OHM F	
R812	RN-4Z1502F	R METAL FILM	1/4 15K OHM F	
R813	RN-4Z2201F	R METAL FILM	1/4 2.2K OHM F	
R814	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R815	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R816	RD-4Z399J-	R CARBON FILM	1/4 3.9 OHM J	
R817	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R818	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R819	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R820	RD-AZ273J-	R CARBON FILM	1/6 27K OHM J	
R824	RN-AZ3301F	R METAL FILM	1/6 3.3K OHM F	
R825	RN-AZ3301F	R METAL FILM	1/6 3.3K OHM F	
R827	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R828	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R829	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R830	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R831	RD-AZ203J-	R CARBON FILM	1/6 20K OHM J	
R832	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R834	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R835	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R850	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R901	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R902	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R903	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R907	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R908	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R909	RD-AZ271J-	R CARBON FILM	1/6 270 OHM J	
R911	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R912	RD-2Z202J-	R CARBON FILM	1/2 2K OHM J	
R913	RD-2Z202J-	R CARBON FILM	1/2 2K OHM J	
R914	RD-2Z202J-	R CARBON FILM	1/2 2K OHM J	
R920	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
RA01	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA02	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA03	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA04	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA05	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
RA06	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA07	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
RA08	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA09	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA10	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J	
RA11	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA12	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RA13	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
RA14	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
RA15	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA16	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA17	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
RA18	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
RA19	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA20	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA21	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA23	RD-AZ220J-	R CARBON FILM	1/6 22 OHM J	
RA24	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
RA25	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RA29	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA32	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J	
RA35	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
ZZ140	PTPKCPE519	PACKING AS	DTX-21G2FZS-SB	
M681	6520010200	STAPLE PIN	#3417 ALL	
M801	DMP5019100	BOX	DTY-21G2 (NEW)	
M811	485819BQ00	PAD	21G2 EPS	
M822	4858219101	BAG P.E.	1300X1150 (U.K) LAMINATED	

7-1 DTX-21G2



REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR
1					
2					

NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
22	4855800022	LABEL SERIAL	1	ART90	
21	4855062000	DECO CTRL	1	PVC T0.25	
20	4857817610	CLOTH BLACK	2	FELT 300X20X0.7	
19	4855415800	SPEC PLATE	1	150ART P/E FILM (C/TV)	
18	4857817610	CLOTH BLACK	3	FELT 300X20X0.7	
17	7178301052	SCREW TAPTITE	1	TT2 WAS 3X10 MFZN BK 3CR	
16	7172401652	SCREW TAPTITE	6	TT2 TRS 4X16 MFZN BK 3CR	
15	4852172311	COVER BACK	1	HIPS GY	
14		CRT	1		
	4856017710	SCREW CRT FIX'	2	5X30 L190 BK 3CR	
13	4856017303	SCREW CRT FIX'	2	5X30 L80 BK 3CR	
12	4856219502	WASHER RUBBER	4	CR T2.0 BLACK	
11		PCB ASS'Y	1	CP-520V	
10	7172401252	SCREW TAPPTITE	8	TT2 TRS 4X12 MFZN BK 3CR	
9	4858317410	SPEAKER	2	SP-58126FC	
8	7172401252	SCREW TAPTITE	10	TT2 TRS 4X12 MFZN BK 3CR	
7	4852090511	MASK FRONT	1	HIPS GY	
6	4857923300	DOOR LOCK	1	LA701(KIFCO)	
5	4851954300	DOOR AS	1	2825711+5554500	
4	4856715600	SPRING	1	SWPA PIE 0.4	
3	4854869711	BUTTON POWER	1	ABS GY	
2	4852330711	PANEL FRONT	1	HIPS GY	
1	48556192SD	MARK BRAND	1	SILVER DIA-CUTTING	

UNITS	mm	Designed by	Checked by	Inspected by	Approved by	ASSY NAME
SCALE	0.250	K.W.S.	W.S.KIM			DEVELOPMENT DWG (1/1)

DAEWOO ELECTRONICS Corp.
Display Research 1 Team, DISPLAY R & D

MODEL	DTX-21G2	D/N	48500***
REFERENCE	CP-520V		

A2(594mm X 420mm)

7-2 DTX-21B4

REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR
1					
2					

NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
21	4855800022	LABEL SERIAL	1	ART90	
20	7178301252	SCREW TAPPTITE	1	TT2 WAS 3X12 MFZN BK 3CR	
19	4855415800	SPEC PLATE	1	150ART P/E FILM (C/TV)	
18	4852161901	COVER BACK	1	HIPS GY 21U7	
17	7172401652	SCREW TAPPTITE	6	TT2 TRS 4X16 MFZN BK 3CR	
16	4857817610	CLOTH BLACK	3	FELT 300X20X0.7	
15		PCB ASS'Y	1	CP-520V	
14	4856017703	SCREW CRT FIX'	2	5X30 L80 BK 3CR	
13	4856017710	SCREW CRT FIX'	2	5X30 L90 BK 3CR	
12	4856219502	WASHER RUBBER	4	CR T2.0 BLACK	
11		CRT	1		
10	7172401252	SCREW TAPPTITE	8	TT2 TRS 4X12 MFZN BK 3CR	
9	4858317410	SPEAKER	2	SP-58126FC	
8	4857818701	CLOTH BLACK	2	FELT T0.7 L=250 W=15	
7	4852088611	MASK FRONT	1	HIPS GY	
6	4857923300	DOOR LOCK	1	LA701(KIFCO)	
5	4856716000	SPRING	1	SWPA PIE0.5	
4	4854868211	BUTTON POWER	1	HIPS GY	
3	4855061500	DECO CTRL	1	PVC T0.3	
2	4851952811	DOOR AS	1	2825111+5940000	
1	48556192SD	MARK BRAND	1	SILVER DIA-CUTTING	

UNITS	mm	Designed by	Checked by	Inspected by	Approved by	ASSY NAME
SCALE	N.S.	W.S.KIM	K.W.S.			DEVELOPMENT DWG(1/1)

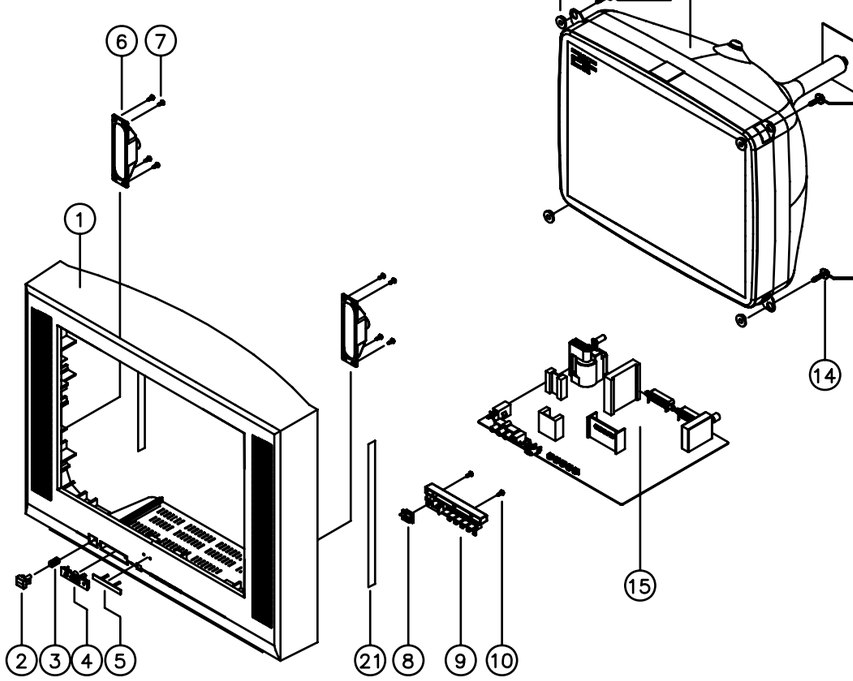
DAEWOO ELECTRONICS Corp. Display Research 1 Team, DISPLAY R & D

MODEL	DTX-21B4	D/N	48500***
REFERENCE	CP-520V		

A2(594mm X 420mm)

7-3 DTX-21U7

REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR
1					
2					



NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
22	4855800022	LABEL SERIAL	1	ART90	
21	4857818701	CLOTH BLACK	2	FELT T0.7 L=250 W=15	
20	7128301251	SCREW TAPPTITE	1	TT2 WAS 3X12 MFZN BK 3CR	
19	4855415800	SPEC PLATE	1	150 ART P/E FILM(C/TV)	
18	4852161901	COVER BACK	1	HIPS GY	
17	7122401652	SCREW TAPPTITE	6	TT2 TRS 4X16 MFZN BK 3CR	
16	4857817610	CLOTH BLACK	3	FELT 300X20X0.7	
15		PCB ASS'Y	1	CP-520V	
14	4856017710	SCREW CRT FIX	2	5X30 L190 BK 3CR	
13		CRT	1		
12	4856017703	SCREW CRT FIX	2	5X30 L80 BK 3CR	
11	4856219502	WASHER RUBBER	4	CR T2.0 BLACK	
10	7128301051	SCREW TAPPTITE	2	TT2 WAS 3X10 MFZN 3CR	
9	4854952901	BUTTON CH	1	ABS GY	
8	4855547601	DECO SENSOR	1	PMMA MILKY	
7	7172401252	SCREW TAPPTITE	8	TT2 TRS 4X12 MFZN BK 3CR	
6	4858317410	SPEAKER	2	SP-58126FC	
5	48556192SD	MARK BRAND	1	SILVER DIA-CUTTING	
4	4857539601	COVER JACK	1	ABS GY	
3	4856716000	SPRING	1	SWPA PIE T0.5	
2	4854862501	BUTTON POWER	1	ABS GY	
1	4852081201	MASK FRONT	1	HIPS GY	

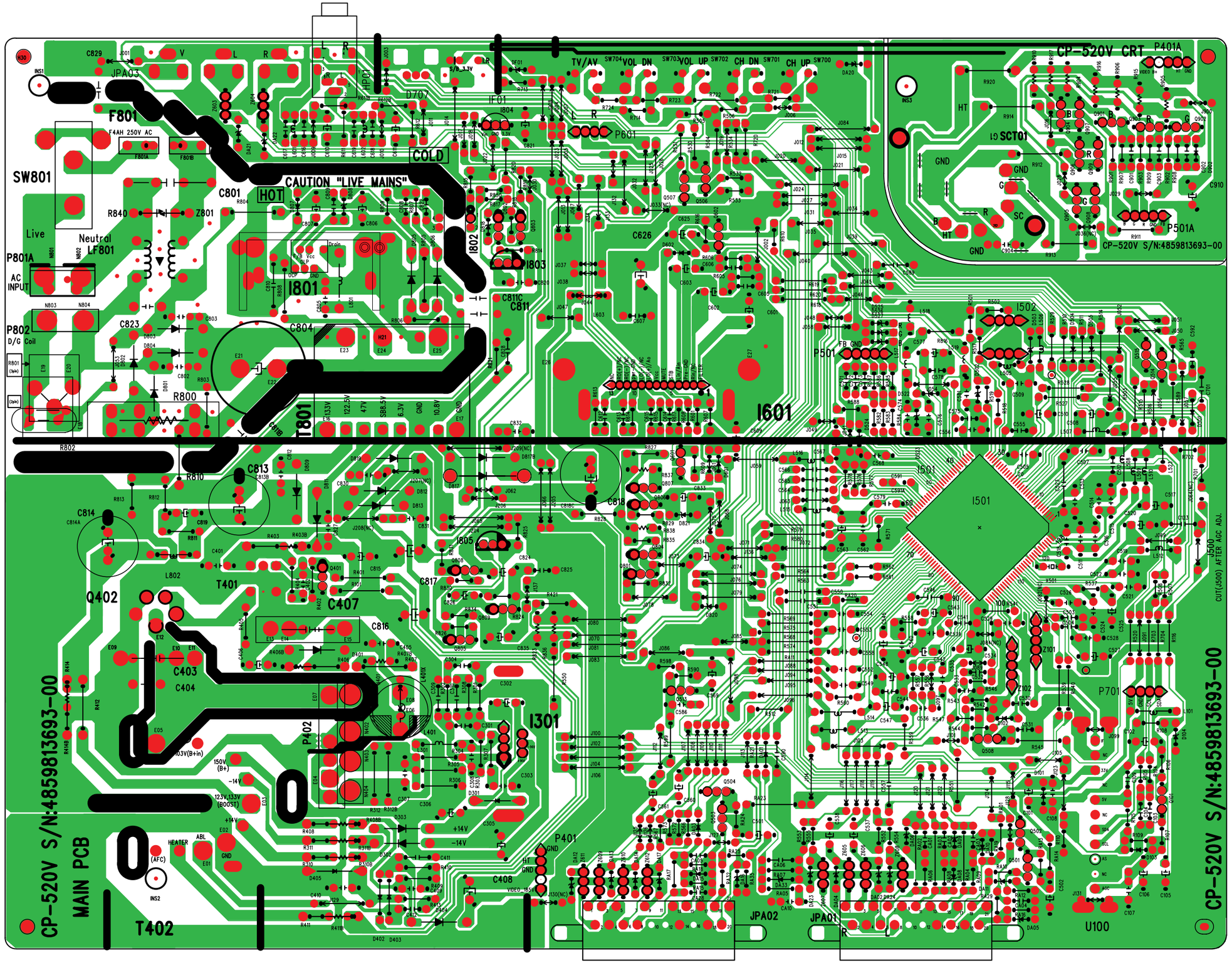
UNITS	mm	Designed by	Checked by	Inspected by	Approved by	ASSY NAME
SCALE	N.S.	K.W.S. 2006.11.29	W.S.KIM 2006.11.29			DEVELOPMENT DWG (1/1)

DAEWOO ELECTRONICS Corp.
Display Research 1 Team, DISPLAY R & D

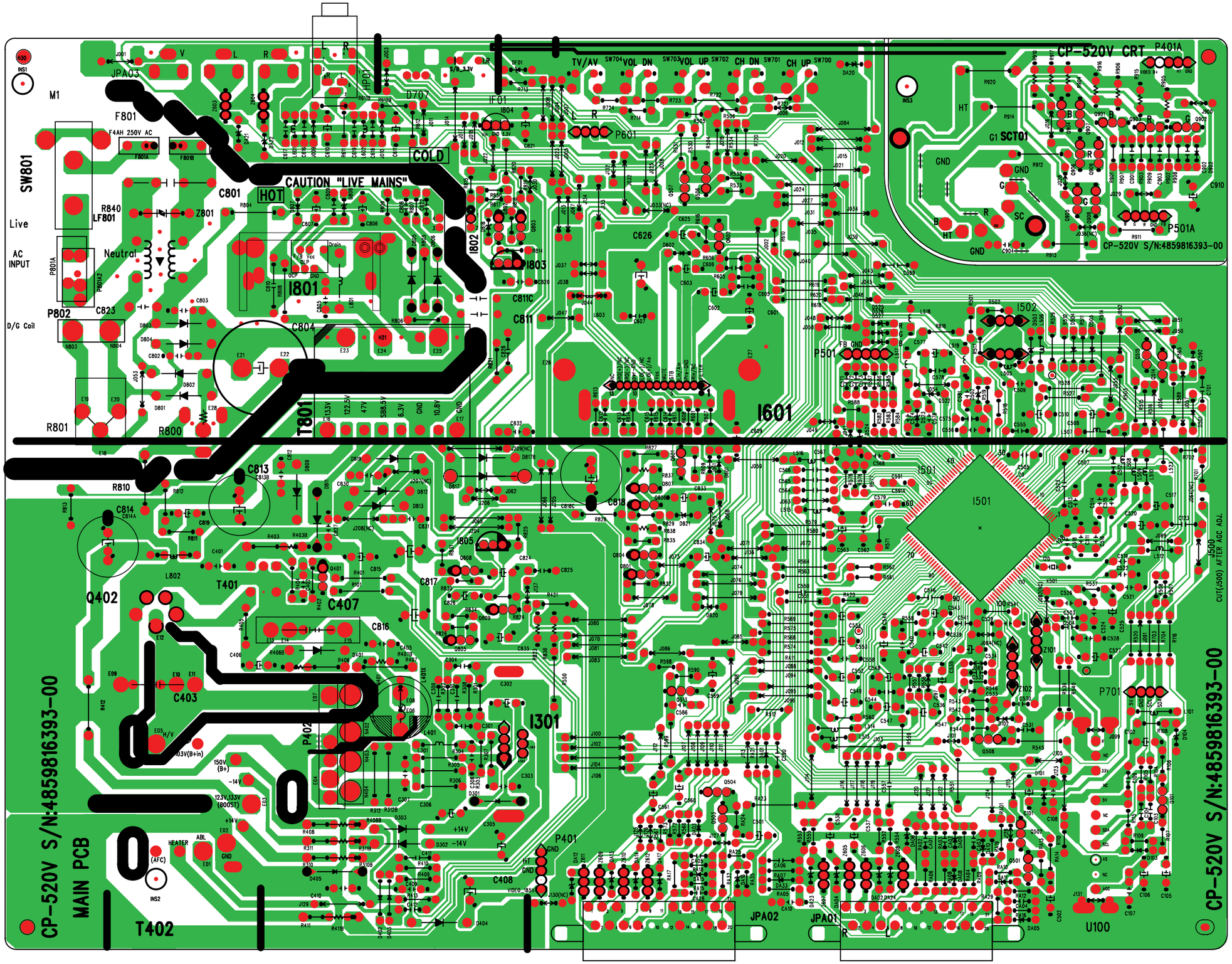
MODEL	DTX-21U7	D/N	48500***
REFERENCE	CP-520V		

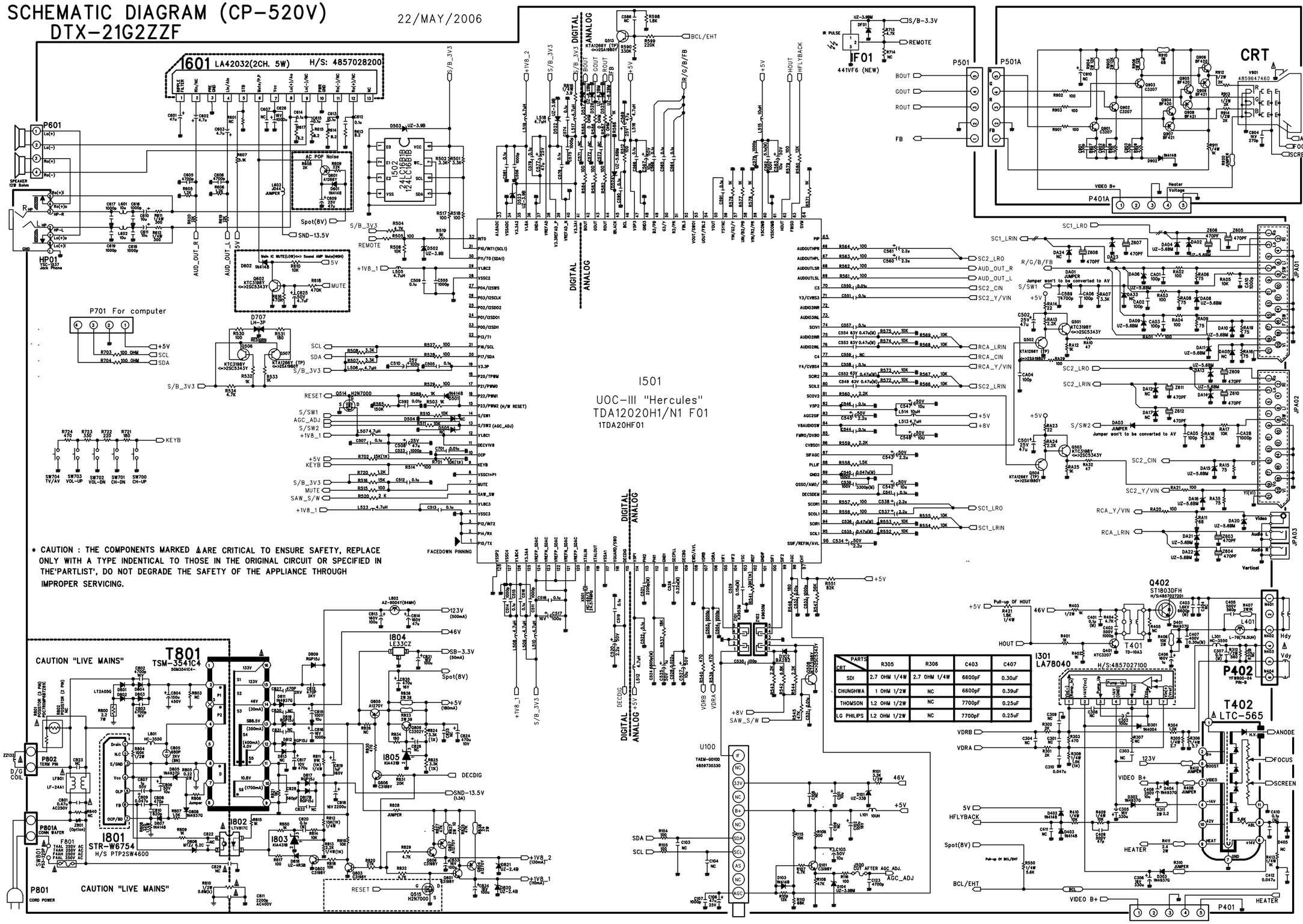
A3(420mm X 297mm)

8.1 4859813693 (OLD PCB)



8.2 4859816393 (NEW PCB)





PARTS / CRT	R305	R306	C403	C407
SDI	2.7 OHM 1/4W	2.7 OHM 1/4W	6600pF	0.30uF
CHUNGHWA	1 OHM 1/2W	NC	6600pF	0.39uF
THOMSON	1.2 OHM 1/2W	NC	7700pF	0.25uF
LG PHILIPS	1.2 OHM 1/4W	NC	7700pF	0.25uF

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